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A Journal of Management, Engineering and Operation
INCORPORATING
The Railway Engineer · TRANSPORT · The Railway News
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GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on further paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list which will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

REDUCTION IN SIZE OF PAGE

To economise in paper our readers will observe a slight reduction in the size of THE RAILWAY GAZETTE *in that the size of the page has been reduced from 9 in. × 12 in. to 8½ in. × 11½ in. The type area of the page remains the same, namely, 7 in. × 10 in., but the surrounding margins have been reduced. This of course detracts from the appearance of the paper, but is one of the exigencies of the war*

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 a.m. till 4 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Public Utilities' War Damage

IN the King's Speech at the opening of the new session of Parliament, on November 11, it was announced that both Houses would be asked in the new session to pass legislation in respect to war damage. It had already become known that the Government had reached an advanced stage with its war damage scheme, and that it would soon be possible to go ahead with its plans. A White Paper has now been issued which contains more details of the scheme. Section 40 of the War Damage Act, 1941, which exempted certain types of public utility undertakings from Part 1 of the Act, which covered buildings and immovable property, is to be repealed and precise definition given of the various undertakings to be dealt with as public utility undertakings. Provision is to be made for a new category of "extensive undertakings." The new legislation will not form a self-contained enactment completely separate from the War Damage Act, but the precise extent to which, and the manner in which, the provisions of the principal Act will be dealt with in relation to public utilities are matters which require further examination. The White Paper states that the consultations which have been going on with representatives of public utility undertakings have proved most valuable, and although they are not yet complete it is believed that further discussions which are to take place before it is possible to introduce a Bill into Parliament would be assisted by analysing the subject as it presents itself in the light of the consultations so far held. For the purpose of applying the contribution proposals, public utility undertakings are to be divided into nine groups: railway, canal, dock & harbour, lighthouse, gas, electricity, sewerage, sewage disposal, and water. These groups are defined in the White Paper, which also lays down the payments and contributions procedure and abstracts from which are given at pages **500-502**.

Transport Grouping Proposals

The railway group is to consist of statutory railway undertakings, including railways in Northern Ireland and the undertaking of the London Passenger Transport Board, but with certain exclusions, as for example a railway carried on by a dock or harbour undertaking, and also certain railways of which the sole or principal traffic is that of manufacturing or mining companies with which they are associated, together with certain undertakings which are wholly-owned by the main-line railways and certain statutory light railways, other than those that are of the nature of tramway undertakings. In the numerous cases in which more than one public utility undertaking is carried on by one undertaker, it is stated that no single principle can be universally applicable. Where there is one undertaking which can be considered as a principal undertaking to which others are ancillary, it appears convenient that public utility undertakings of more than one kind carried on by one undertaker should be considered as one undertaking and fall into the group appropriate to the principal constituent. In other cases, where the undertakings carried on by the same undertaker are coequal and relatively independent, it would appear preferable that each undertaker should be included in each function or group. On the basis of the former principle it is proposed that railway-owned docks should be grouped with railways, and that a railway carried on by a dock or harbour undertaking should be grouped with the rest of the other undertakings. It is in general the intention that the first principle should apply to all undertakings owned by persons who carry on concerns in the railway group.

British Help for South African Railways

On his return to South Africa after his recent flying visit to Great Britain, the Hon. F. C. Sturrock, Minister of Railways & Harbours, Union of South Africa, is reported from Johannesburg to have said in a speech that his trip was to ascertain to what extent the British Government could relieve South Africa's supply position, where the railways are faced with the difficult task of maintaining with pre-war equipment an enormous increase of war traffic. According to Reuters, "the result of his visit—for which he took no personal credit—meant all the difference between maintaining the Union war effort and fading out of the picture." The help which the South African Railways would receive from Great Britain, he stated, would include the delivery before the middle of **1943** of **30** main-line **4-8-2** steam locomotives and **10** electric locomotives. Already wagons were being delivered from Great Britain at the rate of **20** a month, and he had also been able to arrange for a large number from Canada. Mr. Sturrock added that the war machine was being worked by the British Government remarkably well. It may be recalled that he made the return trip by air, and therefore it is of interest that he also foreshadowed that the post-war service between Johannesburg and London would be completed in

24 hours. This sounded unreal, he said, but he could give an assurance that it was well within the realms of possibility. The Union Railways comprise some 12,353 miles of 3 ft. 6 in. gauge line, of which 582 miles are electrified, and 884 miles of 2 ft. gauge. According to the latest available returns, the rolling stock includes 2,276 steam locomotives, 178 electric locomotives, and 53,236 wagons. Details of some of the new orders were given in our last week's issue on page 479.

The Turkish State Railways in 1941

During the year ended March 31, 1941, the financial and operating results of the Turkish State Railways showed an improvement over those of the previous financial year. The number of passengers conveyed was 30,357,583, compared with 25,636,009 during the period 1939-40; of the former figure, 15,851,433 represented suburban, and 14,506,155 main-line, passengers. The amount of goods traffic handled showed an increase under most heads: during the period under review, 45,172 (35,185) *tonnes* of baggage; 242,002 (147,453) *tonnes* of express goods; 22,574 (14,017) *tonnes* of express parcels; 1,594,152 (1,648,781) *tonnes* of service goods; and 5,326,284 (4,306,450) *tonnes* of other classes of merchandise were carried. The receipts (in £T) for the financial periods 1939-40 and 1940-41 were:—

	1939-40	1940-41
Passenger traffic—		
Suburban	£T830,724	£T881,126
Main line	12,232,059	15,849,578
Total	13,062,783	16,730,704
Baggage	329,439	519,893
Express goods	1,944,499	2,508,804
Express parcels	427,441	508,971
Ordinary goods	25,321,280	36,324,009
Miscellaneous goods	844,637	1,135,893
Miscellaneous receipts	954,056	964,584
Total railway receipts	42,884,136	58,692,858
Port of Haidar Pacha	931,377	854,988
Port of Derince	86,813	69,211
Trabzon-Persia transit route	36,971	70,788
Subsidy from Ministry of Communications	185,579	125,000
Total	44,124,876	59,812,845

Since its inception, the administration has constructed 3,733 km. (2,318 miles) of line and purchased 3,248 km. (2,017 miles) of existing line; £T409,671,841 was spent on construction between 1923 and 1941. The State and private railway mileages at the close of the year were little changed; as recorded in our January 16 issue, the 29 km. (18 miles) narrow-gauge Ilija-Palamutluk Railway has been purchased by the State.

Satisfactory Repair Position on Indian Railways

A few of the achievements of Indian railways during the war are recorded in an article on page 505, and one of the principal points made is the important volume of work being turned out of their workshops in the form of munitions production and war work generally. It is the more remarkable, therefore, that, despite such handicaps, the position with regard to the repairs of their own locomotives and rolling stock is now actually better than in the pre-war period. On all the railways there were in the quarter immediately before the outbreak of war 994 broad-gauge locomotives awaiting repair, whereas in the corresponding quarter in 1941 the figure had fallen to 903. In other words, the percentage of the total stock had fallen from 18·8 to 17·1. Nor is this an isolated case. In the quarter ended February, 1942, the number was only 850, against 965 in the quarter ended February, 1939, or a reduction from 18 to 16 per cent.; the position of metre-gauge locomotives was similar. The improvement in the number of broad-gauge wagons awaiting repairs was better still; the corresponding figures in the August quarters were 8,638 falling to 6,994, or 5·6 to 4·5 per cent., and, in the February quarters, 7,128 reduced to 5,840, or 4·6 to 3·7 per cent. of the total stock.

By Rail to Alaska

The war with Japan has brought into prominence the question of land communication between the United States and its northernmost territory of Alaska, which by its geographical position has now acquired great strategic importance. Highway communication is assured by the 1,200-mile road from Edmonton, Alberta, through north-western Canada to Fairbanks in Alaska, and the desirability of alternative railway communication is now being made the subject of close study. As mentioned in our issues of July 3 (p. 6), August 28 (p. 210), and October 2 (p. 330), interest is at present focussed in the Pacific Great Eastern Railway of Canada as forming the possible starting-point of such a scheme, and inquiries have been on foot as to the possibility of its acquisition by United States interests. The P.G.E.R., of which construction was begun before the 1914-1919 war, but suspended in 1921, starts at Squamish, a port 35 miles from Vancouver, at the head of Howe Sound, and extends for 347 miles to Quesnel, which is 75 miles from Prince George, a station 467 miles from the Pacific on the 678-mile branch of the Canadian National Railways from Red Pass Junction to the port of Prince Rupert. The P.G.E.R. is thus at present completely isolated from other systems. Rather than complete the gap of 35 miles between Squamish and Vancouver, the present proposal is to cut through from Clinton, a station 166 miles north of Squamish, through 50 miles of moderately difficult country to join the Canadian National and Canadian Pacific lines at Savona in the Thompson River valley, 225 miles from Vancouver, which would cut out the present most heavily-graded section of the P.G.E.R. from Squamish, and then to complete the 75 miles, also through relatively easy country, from Quesnel to Prince George. This would give a fairly direct rail route from Vancouver to Prince Rupert, shortening the sea route to Alaska considerably until the 1,300 miles of line projected and already surveyed from Prince George to Fairbanks, Alaska, could be brought into use.

Railways and Fuel Economy

The British railways are among the largest users of coal and oil, but, by reason of the importance of the tasks upon which they are engaged, the total volume of fuel which they consume cannot be brought within the scope of ordinary quotas and rationing. Nevertheless, to meet urgent calls for economy in fuels of all kinds, the railways have redoubled their efforts throughout the whole of their organisations to secure further cuts in the consumption of coal, coke, gas, electricity, and fuel oils. Instructions have been issued to railway staffs to exert the utmost economy, and locomotive drivers have been reminded that the saving of even one shovelful of coal on every locomotive would result in an annual saving of several thousands of tons. Fires are not now lighted in waiting rooms, offices, and so forth, unless it becomes absolutely necessary, and when lighted are not refuelled within a certain period before the premises are to be vacated. Wherever possible, passenger lifts in railway buildings are now barred to occupiers and visitors of the first and second floors, so that lifts run non-stop from the ground to the third floor. A comprehensive memorandum on the subject of fuel economy issued by Mr. C. H. Newton, Chief General Manager, to all members of the L.N.E.R. staff was reproduced in our September 25 issue (page 305), and this included an invitation to all members of the staff to make further suggestions for conserving the limited fuel supply. Corresponding steps have been taken by the other railway administrations, and it is not unlikely that the total result will be more favourable than one attained by the arbitrary rationing of fuel consumption.

Speed in Wartime

Even in wartime a convincing case can be made for the maximum speed of passenger service that conditions permit. Such a case was set out in an editorial in the July 18 issue of our American contemporary, the *Railway Age*, by way of commentary on the inauguration, on June 21, by the Missouri Pacific Railroad of its new streamliner, the Colorado Eagle, between St. Louis and Denver. Obeying implicitly the instructions of the Office of Defense Transportation concerning the discouragement of unnecessary travel, the M.P. RR. made no communication to the press or public about the train, other than to state that from this date the Colorado Eagle would replace the Scenic Limited, and to give the revised schedules. No mention was made that a new streamline train was being introduced; and the fact of acceleration could be discovered only by subtracting the new departure from the arrival times. Yet, as the *Railway Age* points out, the new trains have released other wagons and locomotives for war service; they serve intermediate cities in which there are important war production plants, and thereby save the business time both of war executives and members of the armed forces; and by their higher speed they cause less interference with freight traffic, rather than more, as compared with the trains that they have replaced. "There are better ways of discouraging unnecessary travel than removing the means of travel," the editorial continues. "To our way of thinking, there was no stigma attached to these new trains, of which the railway is rightfully proud. Does not the playing down of a development of such wide public interest and benefit indicate that, perhaps, we may be becoming a bit too hysterical in carrying on the war?" Publicity or not, however, on its first trip the Colorado Eagle left St. Louis with 30 standing passengers.

Colours of Hand Signal Flags

For many years British railways were content with two colours for their hand signal flags, red and green, but the yellow flag has been added in recent years, with a yellow glass in some of the hand signal lamps. At one time, however, flags of other colours were used, especially white, as a study of early rule books shows. Some lines had red and white flags only at one time and did not use green, and others had all three. The early

rules of the Lancashire & Yorkshire ordered all goods guards to carry two red and two white flags " for communicating with the engineman." The green flag was then used as a caution indication, a function for some purposes it still retains. Blue flags were used on more than one line at one time and black flags on at least one. To distinguish the green flag from the red with more certainty in a bad light the Metropolitan and District lines had a large white diamond in the centre of the former. It has been frequently the practice on foreign lines to have two colours in one flag for the same reason, or to have special shapes of flag, such as swallow-tailed or triangular, for better recognition. Flags bearing lettering or other signs have also been used. The German lines, for instance, employ a black flag with white P (*Pulver*) on standing vehicles loaded with explosives or a white flag with black death's head when poisonous materials are present. A yellow flag denotes an occupied postal, sleeping, or restaurant car.

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U.S.S.R. Locomotive Power

Rapidly increasing demands for oil in the U.S.S.R. by aviation, the army, agriculture, and industry in recent years, despite the extensive indigenous oil supply of Russia, have had a considerable influence on locomotive development. Thirty-five years ago more than half the steam locomotives in the U.S.S.R. were oil-fired, but the present proportion does not exceed one-tenth; the remaining nine-tenths draw coal supplies in large measure from new coalfields opened out in recent years. For the same reason of oil shortage experiments in diesel haulage, which were begun from ten to twelve years ago, have been abandoned for the time being. So far as steam is concerned, there have been very considerable developments in the size and power of the locomotive units built, made possible by the extensive relaying of main-line tracks and strengthening of bridges which formed a part of the Second Five-Year Plan. As described on p. 488, construction has concentrated chiefly on a large and powerful 2-10-2 design for freight traffic, and a 2-8-4 type for passenger trains, with modern improvements, such as multi-element " E " type superheaters, feed-water heaters, mechanical stokers, and boosters, and, in some cases, multiple-jet blast-pipes and streamlining. With these improvements it has been found possible to increase the evaporation to a maximum of 15·8 lb. of steam per sq. ft. of evaporative heating surface per hr. The use of condensing tenders in districts where water supply is difficult has been extended; it has been reported that over 1,000 such equipments are in service.

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"Austerity" Locomotives for Posterity

ARISING out of present conditions the term " Austerity " has come into much more general use than heretofore. It has now invaded the locomotive field and is being used to denote a class of engine that is to be built in large numbers by British firms for general utility work in both military and civilian traffic. In general appearance and proportions the design conforms closely to the standards usually adopted in this country for the 2-8-0 type of locomotive; it is simple and robust, and can therefore be relied on to give long-mileage trouble-free service on a low maintenance cost basis. The planning of the locomotive and the task of seeing it through the constructional stages and into traffic in the shortest possible time rests with the Ministry of Supply whose officers responsible for the undertaking have shown acumen and skill in their selection of the details, covering dimensions, materials to be used, and methods of assembly, so that economy in time, labour, and cost of producing the engines should be brought within the narrowest limits that are reasonable and, indeed, possible. As things are now, very careful and judicious note has to be taken of availability of materials, simplification of manufacturing methods, and matters of that kind, and a reading of the article appearing on page 492 of this issue will tend to show how this none too easy task has been accomplished in the present case. Criticism of the design and its proportions there will be almost certainly; indeed, we have heard some already, more particularly as to the boiler and firebox, but if comparisons are to be made it will be noted that the " Austerity " design conforms, as we have indicated, to what is customary on British railways for two-cylinder 2-8-0 locomotives, and has proved efficacious for the work which they are called on to perform. Simplicity of detail is the keynote of the design and it would, we think, be difficult to produce an engine of this size and power on a less complicated basis, coming within the limits of size and weight here demonstrated. The engines, it is understood, are being built primarily to meet war conditions but their retention in service after the cessation of hostilities is a possibility which would, in view of the general characteristics of the design, appear to be almost certain, and it is with this in mind that we chose for these comments the otherwise unusual and perhaps rather ominous title of " Austerity Locomotives for Posterity."

Coventry of the G.W.R.

THE retirement of Mr. F. C. A. Coventry, Superintendent of Road Transport, Great Western Railway, marks the end of his active career in rail and road transport spheres, which covers all but half a century and for nearly forty years has been immediately associated with road motor transport. Although Mr. Coventry had a wide experience in railway work and occupied the position of Assistant Superintendent of the Line of the G.W.R. from 1919 to 1922, he was mainly interested in the development of road motor transport in relation to the railways and is as widely known in road circles as in the railway sphere. As is well known, the G.W.R. was a pioneer in the establishment of co-ordinated rail and road services, and with this object it inaugurated a bus service from Helston Station to the Lizard as early as August 17, 1903. Mr. Coventry was under thirty years of age at the time, and he entered into the new venture with enthusiasm. He was transferred in 1904 to the Traffic Department, more particularly in connection with road motor services, and made this section peculiarly his own. He may truly be regarded as a pioneer of mechanical road transport, and his original fleet of Milnes-Daimler vehicles, with low-tension magneto and suction-operated inlet valves, occupied in the sphere of road transport a position comparable with that of the *Rocket* with railway locomotives. Yet, with these British-assembled German vehicles, with their distinctive sloping bonnet and very low inefficient radiator, and complete innocence of ball or roller bearings, Mr. Coventry succeeded in maintaining a timetable regularity on country roads which surpassed that of many London motorbus operators working in infinitely easier conditions. He was one of the Founder Members of the Society of Motor Omnibus Engineers, which held monthly meetings during the period from about 1903 to 1907, at which operators of motor vehicles met to discuss the difficulties, both regarding maintenance and traffic, of the infant industry. Mr. Coventry's practical recital of the problems he was encountering always made his contributions to the discussions of great interest, and he was ever ready to give others the benefit of his own considerable experience.

After the last war, the G.W.R. developed its Road Motor Department into an undertaking which ranked among the largest provincial road transport enterprises, despite its railway ownership, and it was the one railway department of its kind which had the courage to inaugurate lengthy bus services parallel with its own main-line railways, in order to handle local traffic, and to feed the railway. After the main-line railways had been granted extensive road motor powers, the new policy was adopted of transferring passenger road transport activities to associated companies in which the railways secured large shareholdings. It is indicative of the importance of the G.W.R. road interests that, when the Western National Omnibus Co. Ltd. was formed on January 1, 1929, to take over all passenger road services operated by the G.W.R. and the National Omnibus & Transport Co. Ltd. in an agreed area in the West of England (comprising the districts south and west of Exeter as far as the extremities of Cornwall), the G.W.R. portion was transferred to the new company for no less than £180,000 in shares, and involved the transfer of 115 vehicles. Mr. Coventry is retaining his directorships and membership of various road transport joint committees, so that his lengthy experience and wise counsel will not be lost to the industry.

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Buenos Ayres Great Southern Railway

THERE was an improvement of £894,380 in the gross receipts for the year ended June 30, 1942, but working expenses advanced by £703,406, mainly because of the increase of £572,428 in fuel costs. Exchange differences were again a heavy burden, at £1,003,922 against £1,005,140 in the previous year, and the result of working for the year was a debit balance of £396,731, after debenture interest and prior charges, and this, with the debit balance of £535,342 brought forward, makes a total debit balance of £932,073 to be carried forward. The principal reasons for the increase in receipts were first, the large quantities of grain transported, not as a consequence of greater export movement, but on account of the measures taken by the Government to protect agricultural interests, and secondly, the advance in livestock traffic in order to meet the demand for meat and meat-products for export under contracts with the Governments of Great Britain and the United States of America. There has been evidence of plentiful circulation of money throughout the country, caused by the Government policy of subsidising agriculture coupled with high prices of cattle. Local industries have multiplied, and internal trade has therefore been well maintained. Receipts also benefited by the increases since the beginning of April of 5 per cent. in passenger and excess luggage tariffs and of 10 per cent. for parcels and

goods. Suburban passenger numbers rose by 3 per cent. with an advance in revenue of 5 per cent., aided by the appreciable number of new factories opened in the Buenos Aires suburban districts. Some operating figures are given below:—

	1940–41	1941–42
Passengers	57,317,121	58,833,952
Goods, tons	7,134,025	7,954,172
Train-kilometres	23,322,000	23,284,000
Ton-kilometres	2,663,940,000	2,961,271,000
Operating ratio, per cent.	79·42	79·36
	£	£
Passenger receipts	2,586,168	2,731,561
Goods receipts	4,791,552	5,553,389
Gross receipts	10,173,446	11,067,826
Working expenses	8,079,640	8,783,046
Net receipts	2,093,806	2,284,780

In spite of the great difficulty of obtaining and shipping supplies of stores, machinery, etc., the physical condition of the railway and its rolling stock has been maintained at a high level of efficiency. The fuel situation has been aggravated by the increasing necessity of having recourse to firewood.

Plymouth Transport Joint Committee

PASSENGER road transport co-ordination arrangements at Plymouth between the Plymouth Corporation and the Western National Omnibus Co. Ltd. (an associate of the G.W.R. and of Thomas Tilling Limited), which are of considerable importance, have been carried through recently with very little publicity. Brief details were given in our October 9 issue. For many years past the Plymouth neighbourhood has provided an example of an area in which motorbuses of the company and the Corporation have operated along the same routes, but with limitations imposed upon the use of the company vehicles in respect of journeys within the municipal area. Whatever may have been the advantages of affording such protection in the early days of the road transport industry, the trend of recent years for large sections of the local population to move from the town centre to dormitory areas close to or beyond the municipal boundaries has materially affected the position and resulted in some waste of available transport services. Efforts have been made on more than one occasion to evolve some method of overcoming this, as has been achieved in many other parts of the country by arrangement between municipal and company operators, but until recently it has not been found possible to arrive at a common basis acceptable to both parties in the Plymouth area. Doubtless the exigencies of war, and the urgent need to make the most economical use of transport, facilitated the resumption of discussions, and the present scheme for co-ordinating bus services came into operation on October 1.

In broad outline the scheme is based upon a division of receipts, within an agreed area, in fixed proportions decided upon as a result of experience in previous years. The area concerned is bounded by a line through Tamerton, Buckland, Milton Combe, Yelverton, Dousland, Cornwood, Shaugh Prior, Lee Mill, Brixton, and Wembury. Within this area the Plymouth Corporation has been operating a much higher proportion of the total bus mileage than the Western National Omnibus Co. Ltd., and consequently has enjoyed a higher proportion of revenue. The co-ordination arrangement provides for the division of receipts between the parties to be stabilised in proportions of approximately 80 per cent. to Plymouth Corporation and 20 per cent. to the company. An essential feature of the scheme is the establishment of a joint committee on which representatives of the municipality and the company serve. On this committee five members represent the Plymouth Corporation and three the company. The chairman is always to be appointed from the nominees of the City Council, but he does not have a casting vote. No decision is to be binding upon the parties unless it is approved by a majority of both Corporation and company representatives, and, in the event of failure to agree on any matter, the question in dispute is to be referred for determination to an arbitrator jointly to be agreed, on the application of representatives of either side. The first members of the joint committee are as follow: Alderman L. R. Dunstan, J.P., Alderman Solomon Stephens, J.P., Councillor R. H. Baker, Councillor L. J. Hodge, Councillor W. R. Reeve, Mr. F. C. A. Coventry, Mr. Arthur G. Dennis, and Mr. P. G. Stone-Clark. The three last-named are, of course, representatives of the Western National Omnibus Co. Ltd., and it is of interest to note that one of them (Mr. F. C. A. Coventry) is a G.W.R. nominee. It may be added that the co-ordination scheme is concerned exclusively with traffic arrangements. Both the Plymouth Corporation Transport Department and the Western National Omnibus Co. Ltd. retain their own fleets of vehicles, and remain responsible for their maintenance, replacement, and operation, and for the employment of their respective staffs. The Tilling Group has negotiated similar arrangements in past years with York, Bristol, Brighton, and other municipalities.

Recent Permanent Way Practice on the L.M.S.R.

ON another page in this issue we publish the second part of an abstract from Mr. Wallace's paper presented to the Institution of Civil Engineers some months ago. The first part of the abstract dealt with the measures taken to bring L.M.S.R. main lines up to a standard suitable for modern high-speed running, a problem facing all main-line railway administrations in peacetime, and therefore of universal interest. The experience gained is bound to have far-reaching repercussions, especially as it has been obtained by such systematic methods. Improvements in the form of curve realignment and two-level junctions secure three-fold advantages by obviating or reducing speed restrictions and by facilitating maintenance—both direct financial assets—and also by popularising travel as a result of uninterrupted faster and smoother running, a slightly less direct but nevertheless positive credit item. Above all, of course, there is the enhanced safety factor assured.

Improvements at junctions and in rail fastenings on curves to combat transverse thrust and spread of gauge are hardly less important and remunerative measures, and here again the matter has been studied and dealt with with characteristic L.M.S.R. thoroughness. In the light of investigations instigated by the Indian Pacific Locomotive Committee, the results obtained by the L.M.S.R. engineers will be of particular interest in the Indian Empire. What will probably appeal even more strongly to overseas railway engineers and administrations generally is the boldness of the comparative tests of bull-head and flat-bottom types of permanent way on various main-line sections of the L.M.S.R. These tests, as explained in part II, began in a small way, but were soon extended so as to cover various routes with differing intensities and conditions of traffic. As well as the 110-lb. f.b. rail, that weighing 131 lb. a yd. has been under trial in no fewer than 17 localities, the aggregate length tested being five miles. It is clear from Mr. Wallace's notes that the flat-bottom track can best be used with two double-leaf elastic spikes on the inside of the rail, but one wonders if the success of the serrated chair—or one with some other form of projection to bite into the sleeper—could not be secured for flat-bottom track by using a baseplate with similar projections and grip if the grip at the existing baseplate is not sufficient. Even in this extended form, however, these comparative tests are not yet conclusive from the financial standpoint, because the small quantity of flat-bottom track involved cannot compare with quantity-produced standard bull-head and chaired permanent way. The comprehensive experiments with long welded rail lengths and to determine the coefficient of expansion of rail steel are also very valuable. Moreover, it appears to have been satisfactorily established that there is no tendency towards buckling with long continuous bull-head rail lengths in this country, provided ballast is adequate. Even more important are the tests carried out under Mr. Wallace to secure improvement in rail joints.

Finally, it may be of interest to quote here the comparative user of permanent way figures deduced from the paper, as leading up to the track improvements described in the abstract. On the L.M.S.R. approximately 7,900 miles of running line are laid with standard track, or 60 per cent. of the total. The following figures show the variations in traffic over the permanent way. They are, all except column 4, ratios based on the year 1929, the last pre-depression year.

COMPARATIVE USER OF PERMANENT WAY

Year	Engine miles per equivalent track mile	Engine ton-miles per equivalent track mile	Train-miles at booked speeds of 60 m.p.h. and over (daily)
1929	100	100	—
1930	97	97	—
1931	92	95	—
1932	90	93	100
1933	89	96	205
1934	94	103	235
1935	95	107	566
1936	99	114	630
1937	101	116	1,470
1938	98	113	1,540

Column 2 shows the engine-miles per equivalent track-mile, as the locomotive forms the most destructive part of the rolling stock from a permanent way point of view. The equivalent track-miles are the total mileage of running lines plus one quarter of the mileage of sidings. The table ignores the increase in the weight of locomotives and the greatly increased mileage of trains timed at 60 m.p.h. and over, start to stop. The engine ton-miles are obtained by multiplying the mileages run by engines by their average weight (excluding tenders). This assumes equal unit mileage for the different types of locomotive, and is a known understatement, as the new standard designs run more miles per day than the old, and surplus locomotives, pre-war, were all old types of lighter weight. It was not until 1932 that any train on the L.M.S.R. was timed regularly at 60 m.p.h. start to stop, so perforce that year has to be taken as the base.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

G.W.R. "Castle" Locomotives

Bletchley, Bucks.
Oct. 31

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—It is true, as your correspondent Mr. J. F. Smithson remarks in his letter to you on the subject of the above engines, published in your issue of October 30, that the G.W.R. tenders are lighter than those of the Southern Railway and L.M.S.R. locomotives named, but this apart, the "Castle" by itself without the tender weighs less than either of the other two. It may be of interest to other readers to quote the actual figures, which are as follow :—

	G.W.R. "Castle"		Southern Rly. "Lord Nelson"		L.M.S.R. "Royal Scot"	
	Tons	Cwt.	Tons	Cwt.	Tons	Cwt.
Weight of engine only in working order	79	17	83	10	84	18
,, tender—ditto	46	14	56	14	54	13
,, engine and tender—ditto ...	126	11	140	4	139	11

The boiler pressure of the "Castle" is 225 lb. and that of the "Lord Nelson" 220 lb. per sq. in. The latter engine has, however, larger cylinders and smaller coupled wheels, and this naturally is of significance in calculating the tractive force. In any case the reference was to the *smaller* tractive force of the Great Western locomotive.

Yours faithfully,
CHAS. S. LAKE

St. Pancras—Mansion House Services

60a, Green Lane, Northwood,
Middlesex. Nov. 1

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—With reference to the St. Pancras—Mansion House service of 1878, I was able yesterday to see a Midland Railway Company's timetable for May, 1878, announcing the service and giving the times. It confirms the conclusions which were set out in my letter to you recently.

The Midland company's timetable among the alterations to train services had this note:—

> "New service of trains between St. Pancras, Kentish Town, and Earl's Court.
>
> On and after Wednesday, May 1, the Midland Railway Company will run a service of trains between St. Pancras and Earl's Court *via* Acton . . ."

On the page of the timetable giving details of timing between St. Pancras and Mansion House—there is printed against "Earl's Court arr." the words "Change for Mansion House."

The St. Pancras—Earl's Court service consisted (as mentioned in my letter) of fifteen trains each way. The number was not reduced till 1880, so it had a good trial.

Yours faithfully,
REGINALD FELLOWS

First Class Carriages

Freeman's Farm, Thaxted,
Essex. Nov. 7.

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The article in THE RAILWAY GAZETTE of November 6 deals with the economics of first class travel in a highly informative manner, but, confined as it is to the financial side of the matter, it necessarily leaves untouched the question whether those who call for the abolition of the first class carriage really have any right to do so.

As I see it, two distinct questions are bound up in this controversy. (1) Should first class carriages be included in our trains? (2) If the train is crowded, has the passenger with a third class ticket the right to occupy a first class seat?

On the first of these questions I would ask why railways should be distinguished from steamships, theatres, hotels, and indeed from practically every other form of human industry and enterprise? If, as I believe, the proposal to abolish the first class carriage represents, in nine cases in ten, no more than inability or unwillingness to meet the extra cost, why does the proposal leave untouched first class cabins on liners, stalls and dress-circle seats in theatres, and the higher rates charged for more comfortable rooms in hotels? When we discover that all the inexpensive rooms in a hotel have been taken, or that the gallery and pit of a theatre are full up, we do not consider it a grievance but a misfortune. Why should the offer of accommodation at a higher figure constitute a grievance only when it is made by a railway company? Further, since we are asking questions, why should the man who is willing to purchase a certain degree of comfort on a railway journey be deprived of a right he can exercise in practically every other walk of life?

The analogy that is sometimes drawn between our main-line railways and London Transport is, of course, a false one. The two systems have very little in common. But even if the analogy were just, it would not constitute an argument in this case because the man who finds the tube too crowded can presumably take a cab, which, in the matter of travel within a circumscribed area, stands towards the tube much as the first class carriage on a long journey stands towards a third. In short, this agitation to abolish the first class represents no more than the desire of a section of the population to secure something for itself at the expense of another section of the population. It is a demand that can be justified only on the hypothesis that all preferential treatment in return for higher expenditure is immoral. Nobody really believes that.

The second question, whether the man with a third class ticket in a crowded train has a right to occupy a first class seat, is far more difficult, because in such a case sympathy is apt to run away with common sense. In fact, he has no more right to such a seat than he has to demand a stall in the theatre when the gallery is full, or a first class cabin on a Cunarder when the tourist and intermediate bookings are complete. If the railway company chooses to give him the use of such a seat as an act of grace in exceptional circumstances, that is its affair. But even then the company is not a free agent since there is always the risk that by so doing it may detract from benefits it has already sold to other people.

I hope sincerely that the companies will not be too apologetic when dealing with these and kindred demands. They seem to come from two quarters. There is the gentleman, with whom in these days we are all familiar, who starts off by telling you what you are to do with your own property, continues by threatening you with fines and imprisonment if you fail to carry out his instructions, and winds up by remarking that he is your obedient servant. Fortunately, this gentleman is generally amenable to reason. There is also the enthusiastic but irresponsible person who never troubles to enquire where his logic will lead him. To him it should be pointed out that the British railways are no longer the self-sufficient and unimaginative monopolies of times past, that today in efficiency and enterprise they are second to no industry in this country, and that those who control them are well able to manage their own business and should be left to do so.

Yours truly,
ASHLEY BROWN

Locomotive Naming Ceremonies

21, Briarfield Road, Tyseley,
Birmingham. Nov. 2

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In your issue of October 16, in a letter on naming ceremonies of the "Merchant Navy" locomotives, whilst paying tribute to the work of the Merchant Navy, Mr. Howard asks if equal service is being rendered by the speeches at these events. I am of the opinion that the interesting particulars given by Lord Essendon were appropriate and timely, in that they give us a deeper appreciation of the vital and hazardous work which the Merchant Navy is called on to perform. It would appear that Mr. Howard considers that time is being wasted by these ceremonies. I cannot agree. There are heroes working in obscurity in the Merchant Navy (and indeed on the steel road, too), who are as brave as any of the valorous ones who have gained fame and honour in the air or on the battlefield. The Southern Railway recognises this and pays tribute to Great Britain's shipping heroes by calling the new locomotives the "Merchant Navy Class," and christening them in honour of that cause. If it is a waste of time to hold such naming ceremonies, which cannot be complete without a few particulars being given concerning the shipping lines the engines are named after, why waste time in honouring and decorating those who have gained fame in the air and on the battlefield?

As to the development of the Pacific type, I fail to understand in what way the engines of 1937 could be called a myth, considering the excellent work they are now doing. The only engine which I suggest could be so called was Mr. Churchward's G.W.R. engine of 1908, as it will be recalled that it was some fourteen years later before the second British "Pacific" engine was constructed, and during that time, 1908 to 1922, no further engines of the type were built and neither was the design improved on until Mr. Gresley introduced his "Pacific" engine for the Great Northern Railway in 1922.

Yours faithfully,
A. RICHARDS

The Scrap Heap

Recently the L.M.S.R. ran 11 special trains to convey 82,071 bags of mail for shipment to prisoners-of-war.

* * *

No less than 311,433 meals were supplied to troops in transit by special train during 1941-42 by the Refreshment Services Branch of the Victorian Government Railways. The record number for any one week was 35,000.

* * *

The Stationmaster at Whitchurch (Salop), L.M.S.R., decided to make last October a record month for rubber salvage, and, with his foreman and his carter, scoured the town and countryside as they went about their district. As the result, they obtained two wagon loads of old tyres and inner tubes to help the L.M.S.R. rubber-recovery campaign.

* * *

The exhibition at L.M.S.R. carriage-cleaning sheds of a "target" representing the weight of newspapers and other salvage that carriage cleaners should try to recover each month has encouraged the staff to such an extent that the amount of paper now recovered is double what it was recently. The monthly collection of waste paper from this source alone on the L.M.S.R. is now equal to one million copies of a daily newspaper.

* * *

Although he is 81 years of age, Mr Frederick Sims, of the Southern Railway, is doing his bit towards the war effort by helping to speed the country's goods traffic. Mr. Sims joined the London & South Western Railway, at the age of 15, in 1876, and became eventually stationmaster at Tavistock, from which position he retired in 1926 after nearly 50 years' service. In 1928 he joined a firm of estate agents, with which he remained until 1940, when he decided to take a little rest. This did not last for long, however, for Mr. Sims visited some old railway colleagues, with the result that he decided to return to his "first love," and, after a brief period at Exeter, took up a position at Plymouth (Friary) Goods Depot.

Mr. F. C. A. Coventry alongside the driver of the first G.W.R. motorbus, which inaugurated the Helston-Lizard service on August 17, 1903

* * *

Three men were waiting for a train. As it was delayed, they made several journeys to the bar and periodically asked the stationmaster when the train was likely to arrive. When it did so, the trio were feeling rather bright and decided that they would have one last round. Just as they were finishing, the station bell rang and the guard blew his whistle. As the train started, two of the party scrambled through the last door of the last carriage, leaving the third member on the platform yelling with laughter.

Approaching him, the stationmaster said, in a puzzled tone: "Here, you have been pestering me for an hour as to when the train was leaving, and now your two friends have caught it and you are left behind."

"Sh-sh, not a word to anyone," came the reply; "those two idiots came to see me off!"—*From "The Victorian Railways News Letter."*

* * *

Mr. Henry King, of Taunton, who was 107 years old on November 10, was presented on that date with 107 shillings by the Taunton Staff Association of the Great Western Railway, with which he had worked.

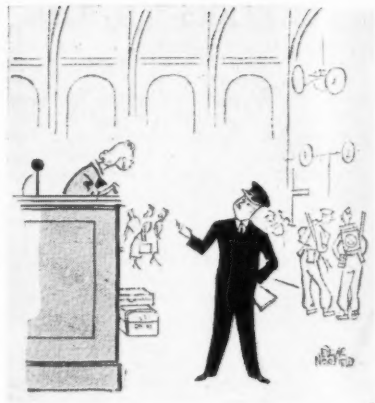
* * *

Some people in England think they know how transport should be run. Let them go to New York, where they will see "scientific transportation." Here is no pampered, effete existence—no lolling on seats or leisurely strap-hanging; passengers must stand on their own feet, or someone else may. They are selected carefully according to height before being allowed to board a train. Equal numbers of tall and short passengers are allotted to each coach: this selection by height means the contours are so arranged that maximum loading is attained. Smoking is not permitted anywhere on the New York Underground, thus contributing to the civilising effect of transport and the building of moral character by self-denial. It also avoids passengers running about looking for a smoking coach. If you are not placed quite comfortably before the doors can be closed, a courteous official gently places his knee in the middle of your back and ensures that other passengers make room for you. A great advantage of travelling in the Underground is that you think you are going fast because there is a great deal of noise, which is much safer than the other way round, because you only *think* you are coming off the rails. *Condensed from the Notebook of an Imaginary Visitor to New York.*

* * *

10,000 Railway Tickets

In the notice of Mr. G. F. Quartermain's death it is stated that he had a collection of some 10,000 railway tickets. How would he get these? On two occasions in my life I have passed the ticket collector with my railway ticket still in my hand, and have felt guilty weeks after. I still have these two tickets which are my collection, and except at the expense of a guilty conscience I cannot see how I am going to add to my collection.—*Mr. F. S. Hart in a letter to "The Times."*



"Just tell them the 9.45 goes to Stratford-on-Avon. You can cut out all that stuff about Anne Hathaway and the Immortal Bard"

[*Reproduced by permission of the proprietors of "Punch"*]

A Shipping Order

The enthusiasm of railway "fans" knows no bounds. Our associated monthly contemporary, *The Railway Magazine*, is frequently asked to supply lists of locomotive names and numbers running into several dozens. The time and labour entailed in compiling the lists asked for is frequently beyond the capacity of reduced wartime staffs. A peak has been set by a recent request that the number, name (if any), and shed should be supplied for every locomotive working on one of the four main-line railways. It is still open, of course, for some young enthusiast to seek similar details for every locomotive running on British metals.

* * *

There are many straight stretches of railway track on the Canadian National Railways system. The longest is on a branch line in western Canada, commencing near Camrose, and ending at Alliance, Alberta, a distance of 57·6 miles. The second longest, totalling 55·45 miles, is a stretch of Central Region main line between Komoka and Chatham, Ontario. Next in order is a portion of main line in the Western Region which measures 46·9 miles, on the route of the Continental Limited, from Cutarm to just west of Melville, Saskatchewan. East of Kent Junction to west of Catamount, N.B., is the longest straight stretch (30·28 miles) in the Atlantic Region. The longest stretch on lines operated by the Canadian National Railways in the United States is located on a line running from Durand to Grand Rapids, Michigan, and measures 28·03 miles.

* * *

Twinkle, twinkle, little Arc.
Sickly, blue, uncertain spark,
Up above my head you swing,
Ugly, strange, expensive thing.
Now the flaring gas is gone,
From the realms of Paddington,
You must show your quivering light,
Twinkle, blinkle, left and right.
Cold, unlovely, blinding star,
I've no notion what you are,
How your wondrous "system" works,
Who controls its jumps and jerks.
Though your light perchance surpass
Homely oil or vulgar gas,
Still (I close with this remark),
I detest you, little Arc.

From "Lines to the Electric Light at the G.W. Railway Terminus" in the "St. James's Gazette," 1888.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

WESTERN AUSTRALIA

Perth Trolleybuses

Reference was made in our March 27 & April 3 issues to new trolleybus chassis which were built for the Canton municipality, but which, due to hostilities, had been made available for sale to other trolleybus users. The eighteen of these chassis purchased by the Western Australian Government for use on the Perth & Metropolitan Tramways system now have arrived, and the construction of bodies has been put in hand; the latter are being built at the Midland Junction Railway Workshops, where all previous trolleybuses in use in the State have been constructed. Two of the new buses have been completed and placed in traffic already; they are similar in general design to those now in use, with the exception that they have two axles as opposed to the three axles of the latter vehicles. The new buses include also features making for greater comfort, including a new type of window which will permit of a greater circulation of air through the vehicle.

Employment of Lady Clerks

The drain on the manpower of the Western Australian Government Railways for military reasons has necessitated arrangements being made for an increase in the employment of lady clerks, hitherto restricted to typing and machine work, on general clerical duties. The broad principle adopted is that girls will be engaged for the duration of the war only, and, if not during that period absorbed in other positions now filled by girls, at the termination of the war they will have to make way for the men whom temporarily they have replaced. Applications are being invited through the press from those desirous of being considered for positions as vacancies occur, and applicants are required to appear before a staff-selection board, after which, if considered suitable, they are listed for appointment in order of selection. A further decision in respect of lady clerks in the railway service is that while blackout conditions continue they shall not be required to work later than 5.30 p.m. in winter or 6 p.m. in summer, so that they may reach home during daylight. Several girls already have been engaged, mainly in the office of the Comptroller of Accounts & Audit, with satisfactory results.

VICTORIA

Producer-Gas Vehicles

Since the first experimental conversion in November, 1939, the Victorian Government Railways have equipped for producer-gas operation 35 departmental trucks, 14 rail motorcars, 5 departmental cars, and 11 other vehicles. As the result of experience, progressive improvement in performance has been achieved. The saving in petrol now represents nearly 90 per cent. in the case of the rail motorcars, and about 80 per cent. in the case of the departmental cars; the administration is experimenting also with the possibility of eliminating the use of petrol by means of the employment of electrically—and manually—operated blowers. No greater engine-wear is said to have been experienced with producer-gas, than with petrol, operation.

Staff Shortage

Over 4,300 men, representing approximately 17 per cent. of the staff, have left temporarily the staff of the Victorian Government Railways for other forms of war service. Of these, over 2,400 are serving with the Armed Forces, more than 300 are on loan to the Commonwealth Government in various capacities, and about 1,600 are employed exclusively on munitions production. Their absence is felt considerably, especially in view of the large quantities of livestock, wheat, and war materials requiring movement; and some time ago the Commissioners were compelled to apply for the release of 270 men, comprising 40 former members of the locomotive staff, 30 former transport employees, and 200 skilled labourers.

UNITED STATES

Southern Pacific Improvements

New yard tracks, leads, and crossovers are being laid in by the Southern Pacific at its westbound yard at Avondale, Louisiana, 12 miles from New Orleans, comprising 6½ miles of new lines and 36 turnouts. Another improvement concerns the Houston-to-New Orleans main line between Crosby and Sheldon, Texas, 22 miles west of Houston, where a relocation 2,240 ft. long, including 990 ft. of trestle viaduct, is being constructed to eliminate a permanent speed restriction.

Curtailing Crossing Accidents

Active steps are being taken in the United States to curtail the excessively-high casualty rate resulting from accidents at level crossings. Appeals by Mr. W. M. Jeffers, President of the Union Pacific Railroad, to the Governors of Nebraska, Idaho, and Wyoming, have resulted in the issue of proclamations calling on drivers of all motor vehicles to bring them to a stand before they cross railway tracks. The Oregon State Highways Commission has issued an order calling on all motor vehicles to stop before they pass over railway tracks at a state highway crossing. Other States have been asked to take similar action; a special reason at the present time is the serious delay and damage to vital war equipment, and the risk of the lives both of service personnel and of ordinary passengers, by the gross carelessness displayed by road users at rail crossings.

Refrigerated Containers

Among the commodities carried under the "less-than-carload" system of American railways are perishables, and in this realm a method, introduced on a small scale in February, 1939, now is assuming much larger dimensions. It is known as the "refrigerex" container system, and was developed by the Railway Express Agency for handling small consignments requiring refrigeration. The design of the container originated with the Church Freight Service of New York for moving oysters, frozen fruits and vegetables, poultry, meat, fish, ice cream, and similar commodities. Each container is a double-walled metal box, insulated all round with spun glass, and fitted with a hinged lid and castors. The interior measures 44 in. × 22 in. × 20½ in. deep, and has a capacity of about 10 cu. ft.; the ice-box, supported by lips resting on the inner edge of the container, is 21 in. × 11 in. × 11 in., and holds 90 lb. of water ice or 100 lb. of dry ice. The container weighs roughly 250 lb. empty. If the container is pre-cooled to the correct temperature before it is packed, the contents of the ice-box will maintain that temperature within narrow limits for four or five days. This property has made the containers of the greatest value in transferring consignments of blood, in connection with the Red Cross "blood bank," between clinics and processing laboratories, for the blood must be processed within 24 hr. of collection, and kept in glass at an even temperature of 41° F. In carrying blood traffic, the containers move as a shuttle service between the collecting centres and the laboratories, full in the forward direction, and returning with the empty bottles; but when handling miscellaneous perishables the containers are worked from place to place as required, like wagons, carrying paying load all the time. If receivers have not sufficient refrigerator space to accommodate all the contents of a container, they may use it for storage while its contents are being sold, at an appropriate demurrage charge, and a special glass-panelled display top is available for this purpose. The number of these refrigerated containers in service is rapidly increasing, and in war conditions blood ranks first among the commodities carried.

BOLIVIA

The Atocha-Villazon Railway

The State-owned Atocha-Villazon Railway, which connects the Bolivian railways with the Argentine Northern system through the frontier junction at La Quiaca, recently has been the subject of criticism in the press, on the grounds of alleged failure to handle the increased traffic. The railway, which is 123 miles long, on the metre gauge, is leased for working to the South American Mining Company. In a recent interview with a press representative, Señor Luis Mendoza, General Manager of the Bolivian National Railways, explained how the recent increase of traffic, due to present abnormal international conditions, had overtaken the normal ability of the railway to augment its equipment, especially in view of the difficulty of obtaining delivery of locomotives and rolling stock already on order. In 1936 the railway handled 20,482 tons of goods; by 1941 this traffic had increased to 118,793 tons. As many as 300 loaded cars arrive from Argentina in one month. Admittedly the locomotives are obsolescent, and engines borrowed from other lines have not given entirely satisfactory results, but four new locomotives ordered from the United States should arrive before the end of the year. Also on order are 300 freight cars, but the date of delivery is uncertain in present conditions.

New Supplementary Road Services

The Bolivian Minister of Public Works recently announced that a credit of 1,400,000 Bolivianos had been authorised for the establishment of a motorbus and lorry service between Vila Vila and Santa Cruz, to supplement the railway between Vila Vila and Cochabamba. The new services will penetrate one of the principal agricultural areas of the country, where both passenger and freight service requirements are understood to be in excess of the present capacity of the railway.

New La Paz-Buenos Aires Trains

Two trains a week, instead of one as formerly, are now running between La Paz, the capital of Bolivia, and Buenos Aires, the capital of Argentina. The schedule of the new trains provides for a departure from La Paz at 2 p.m. on Sunday and arrival at Buenos Aires at noon on Thursday. In the reverse direction the new train leaves Buenos Aires on Sunday at 5 p.m. and

arrives at La Paz at 5.30 p.m. on Thursday. The new schedule has been in operation since July 5.

SPAIN

The Esla Viaduct

The completion is announced of the great viaduct which is to carry the new Zamora-Corunna Railway over the river Esla. This great bridge, said to be the largest of its kind in the world, has been constructed to the designs and under the direction of the State Railway Department. It is of armoured concrete, 500 metres (1,640 ft.) long, with one central arch and five smaller openings at each end. The great central arch has a span of 210 metres (689 ft.), and a height above water level of 47 metres (154 ft.). The viaduct carries the broad-gauge double-track railway, as well as the two tracks of the main highway, and is situated at Km. 22 of the railway line from the terminus at Zamora.

SWEDEN

Railway Results

The earnings of both the Swedish State Railways and the private railway companies were higher in July last than in the corresponding month of 1941. The private railways' earnings for July totalled Kr. 14,600,000 (compared with Kr. 12,300,000 for July, 1941), earnings from passenger traffic having risen by 21 per cent., and earnings from goods traffic by 19 per cent. over last year. Expenditure for the same period rose to Kr. 10,500,000 (compared with Kr. 8,500,000), so that the surplus was Kr. 4,100,000 (compared with Kr. 3,800,000), and the net profit, after deduction of interest, renewal-fund reserves, taxes, and other items, was Kr. 2,300,000 (compared with Kr. 2,200,000). For the period January-July of this year, earnings totalled Kr. 89,300,000 (against Kr. 77,200,000 for the same period in 1941), and expenditure Kr. 67,500,000 (against Kr. 56,900,000), so that the surplus was Kr. 21,800,000 (against Kr. 20,300,000). The net profit for the period of seven months was Kr. 8,600,000, the same as for that of last year. A sum of Kr. 5,600,000 was assigned to the renewal fund, compared with Kr. 5,100,000 for the same period in 1941, and larger amounts than previously have been reserved for certain purposes. The State Railways report for July earnings of Kr. 45,800,000 (compared with Kr. 39,800,000 in July, 1941), and expenditure of Kr. 30,000,000 (against Kr. 25,800,000). For the period January-July, earnings amount to Kr. 281,100,000 (against Kr. 237,900,000), and expenditure to Kr. 200,800,000 (against Kr. 167,400,000), including Kr. 17,200,000 (Kr. 16,100,000) placed to the renewal fund. The surplus thus was Kr. 80,300,000 (Kr. 70,500,000), and, as the interest to be paid on borrowed capital was only a little more than in 1941, the net surplus was Kr. 57,100,000, compared with Kr. 47,900,000 for last year.

U.S.S.R.

Locomotive Developments

During the last ten years, with the assistance of an extensive programme of track-relaying and bridge-strengthening which formed part of the Second Five-Year Plan, the U.S.S.R. locomotive authorities have increased greatly the size and power of the standard locomotive classes operating over the principal main lines. These developments began in about the years 1931 and 1932, when several heavy American locomotives of the 2-10-2 and 2-10-4 wheel arrangements were put into operation on the Donbass and other lines carrying heavy traffic. A Beyer-Garratt 4-8-2 + 2-8-4 locomotive, the largest ever exported from Great Britain, was obtained from Beyer, Peacock & Co. Ltd.; and in the U.S.S.R. Lugansk Works two locomotives with the unique 4-14-4 wheel arrangement were built in 1934 for working over the new Moscow-Donbass direct line. But it is on two standard types designed about this period that construction since has been concentrated chiefly. One is the 2-10-2 "FD" (Felix Dzerjinsky) class, for freight service, and the other the "JS" (Josef Stalin) class, for heavy express passenger work. Both have two cylinders 26½ in. dia. × 30¼ in. stroke; the 2-10-2s have 4 ft. 11 in. coupled wheels, and the 2-8-4s 6 ft. 1 in. coupled wheels. Boilers for both classes have a combination of wide and Belpaire fireboxes; they carry a working pressure of 213 lb. per sq. in., and the total evaporative heating surface is 3,177 sq. ft.

New Standard Types

The freight locomotives, which are gradually superseding the thousands of 0-10-0 freight engines supplied by Germany and Sweden, and built in the U.S.S.R., after the last war, have plate frames, "E" type superheaters, and feed-water heaters, with mechanical stokers and boosters; they are modelled largely on the American 2-10-2 locomotives which were imported in 1931, with modifications and improvements.

Comprehensive tests have shown that, at a firing rate of about 120 lb. of coal per sq. ft. of grate area per hr., evaporation is at the rate of 13·5 lb. of steam hourly per sq. ft. of evaporative heating surface, and that a tractive effort of 43,800 lb. can be maintained at speeds up to 17-18 m.p.h., with a plain circular blast nozzle. On certain of the 2-8-4 locomotives, however, a multiple-jet blast-pipe is in use, with four circular openings having an aggregate area 32 per cent. greater than that of the single circular nozzle, also separate exhausts from both cylinders and a chimney of enlarged diameter; with this modification it has been possible to increase the evaporation to 15·8 lb. of steam per sq. ft. of evaporating heating surface per hr., due to reduction in back pressure, and the horse-power output has been increased correspondingly.

The frame, suspension, axlebox, and truck arrangements in the 2-8-4s differ from those of the 2-10-2s, although the boilers, cylinders, and motion, including the limited maximum cut-off, are the same. The passenger engines, which replace earlier Pacific and 3-cylinder 4-8-0 types, work over the Moscow-Leningrad main line, and other routes radiating from Moscow, and several of them have been streamlined; the freight engines now work most of the mineral traffic on the Donbass, Donbass-Moscow, Kusbass-Ural, and other lines; they handle trains of 40 to 50 bogie wagons, which, when loaded, weigh up to 3,000 gross tons.

CEYLON

Railway Budget

In introducing the railway budget for the coming financial year, the Leader of the State Council said he hoped that a satisfactory solution would be found before long to the difficulties of the island's transport system, both rail and road, which had been caused by abnormal demands and the shortage of petrol. He added that the advice of the Director of Transport would be of considerable help. He stated that the expenditure of the Ceylon Government Railway for the coming financial year was estimated at about Rs. 28,000,000, and the estimated earnings at Rs. 24,000,000. The sum payable from revenue to meet the deficit in the working of the railway was nearly Rs. 4,000,000.

Petrol for Goods Transport

The question of petrol supply for road-haulage services was considered recently by the Executive Committee of Local Administration, and a suggestion was approved that the Petrol Controller, rather than issuing coupons direct to lorry owners, should issue these to the organisers of the newly-formed groups (see THE RAILWAY GAZETTE of September 18, page 270). The latter would be able to supply coupons to individuals.

Road Passenger Services

The Minister of Local Administration recently moved in the State Council the approval of recommendations of the Executive Committee to the effect that bus services should not be operated in any district except under exclusive licence, but that the licensee should compensate displaced operators; and that, if such licensees should combine to form limited-liability companies, the latter should be granted exclusive licences, provided that any person operating a bus under licence who might elect not to join the company should be compensated. In introducing the motion, the Minister said that these proposals provided for a further advance in the organisation of the road-transport system. He said that when Mr. Nelson had arrived in Ceylon the Government, rather than allowing him to make recommendations for the improvement of transport conditions in general, had felt that he could be employed better in the first instance in dealing with the immediate problems of the communications services. Mr. Nelson had found that the first requisite was to put into effect some such scheme as he had recommended. There were two aspects of the present proposals, the more important of which was the need for rationalisation in the interests of the war effort; the other was that, in achieving the emergency objects, the foundation should be laid for the permanent improvement of the transport services. The Minister said that six companies already had been formed; he added that it was not the intention to make road services subsidiary to the railway, or to give the latter any unfair advantage.

Criticism of the motion included an expression of concern lest such limited-liability companies as might be formed should become insolvent, when there would be a danger of foreign capitalists buying up the shares.

(Reference to the limited-liability company scheme was made in our September 18 issue, page 270, and in our September 25 issue, page 294.)

JAPAN

Shimonoseki-Moji Tunnel

It is stated from Tokyo that regular passenger and goods services are to commence through the Shimonoseki-Moji submarine tunnel (see THE RAILWAY GAZETTE of May 1), and that the journey time will be only ten minutes, as compared with the four hours previously required to travel between the two points. Work is to be speeded up on the conversion of the Tokyo-Shimonoseki line to standard gauge.

Permanent Way Tests and Practice on the L.M.S.R.—II

Abstract of a recent paper by Mr. W. K. Wallace to the Institution of Civil Engineers—(concluded)

IN June, 1937, a mile of standard 95-lb. rail in 120-ft. lengths was laid in the down fast line near Boxmoor Station, on a curve of 140-ch. radius. The expansion spaces were $\frac{3}{8}$ in. instead of $\frac{5}{16}$ in. at the temperature of laying. The rails have given no trouble and run quite satisfactorily, but there has not been a sufficient decrease in maintenance to offset the extra cost.

In 1937, about 1 mile of the down fast line between Ampthill tunnel and Bedford was laid with 60-ft. rails. Alternate joints were butted tight, the remainder having the normal expansion for a 60-ft. rail. Both fast lines through Watford tunnel, 1 mile 57 yd. in length, were laid in 1937 with 60-ft. rails butted together throughout, excepting for three lengths at each end, where the expansion increased to the normal allowance at the tunnel mouth, and a gap was provided every fourth joint to facilitate rail changing. At first the joints could not be detected when travelling in a train, but now are audible, though much less than usual in tunnels.

Sleepers near rail joints usually require more attention than those situated in the middle of the rails. In the U.S.A. it is generally held that 40 per cent. of the time spent in packing sleepers is at rail joints. To test whether B.S. bull-head rails welded into long lengths with their much less lateral stiffness than flat-bottom sections, would carry the compressive stresses set up by summer temperatures without risk of buckling, the joints were thermit-welded in two lengths of single track on a disused line lying in an almost north-south direction, and situated on an embankment. Each length was 507 ft. long, and was free to expand at both ends. One length was on straight and the other on a curve of 63-ch. radius. The 84-lb. L.N.W.R. rails were 30 ft. long before welding in September, 1936. They were keyed up at a temperature of 20·3° C., and observed periodically until a day in the following March when the temperature was −1.0° C.

Variations of gauge were negligible; lateral displacements of the track did not exceed 0·1 in.; and longitudinal movements of the rails at each end were about $\frac{1}{2}$ in. for a temperature difference of 31·3° C. Vertical movements of the rails were 0·1 in. on one occasion at one place, but at all other times of the order of 0·03 in. Maximum stress in the rails was just over 2 tons per sq. in. for a temperature difference of 21·3° C.

Both lengths were then welded together by inserting closure rails and a further 1,172 ft. of straight track welded on at one end. Thus, 2,213 ft. in one welded length was obtained. The road was keyed up on a warm day (September 3, 1937), steel keys being used throughout. Observations were made periodically until April 9, 1938, when the temperature being 30·9° C. lower than when the rails were keyed up, final measurements were made. Variations of gauge were negligible; there was no lateral movement in the central portion of the track, which had withstood the maximum stress changes. On April 13, 1938, for a temperature rise of 35·4° C., the sum of the two end longitudinal movements was 1·68 in. and 1·69 in. for the east and west rails, respectively. Five months later, the sums of the end movements were 2·34 in. and 2·25 in. for a temperature change of only 28·0° C., greater movements despite a smaller rise of temperature. The explanation of this is that the ballast between the sleepers had become displaced near the ends of the length due to repeated movement in and out as contractions and expansions occurred during the five months, and in this condition offered less resistance to the side face of the sleepers. It can be accepted that the whole of the rail in the central portion was in complete restraint.

Simultaneously with the experiment on the long welded length observations were made to determine the coefficient of expansion of the rail steel. A 300-ft. length of rail similar to that in the welded length was laid sideways on 2-in. dia. rollers supported on the flat tables of slide chairs. These rails were joined by fishplates, and a run of welding was added to ensure that no relative movement occurred between the adjoining rails. One end of the rail was anchored in a large concrete block built round it, and the other was free. The value of the coefficient of expansion for the rails in question was found to be $11{\cdot}52 \times 10^{-6}$ per 1° C. Using this value, the average change of stress in the central completely restrained portion, 2,213 ft. of welded length, was calculated to be 5·3 tons per sq. in. compression when the temperature had risen 35·4° C. on April 13, 1938. It was obvious from the stress curve plotted that the stresses in the 507-ft. lengths, originally tried, would have never materially increased.

The result of the test showed that the rails each withstood 41·7 tons compressive load in the centre portion without tending to buckle. The track was laid on a formation once double line, so that there was 18 in. of ballast against the ends of the sleepers to resist any tendency to side movement. By keying up at a moderate temperature when relaying, stresses may be tensile at times and compressive at others, and would be lower than those found in the experiment. To ascertain the effect of traffic, a 2-6-0 engine and a short train were run over the length at first slowly and then up to a speed of 42 m.p.h. The highest average temperature during this trial was 38·5° C. In the central portion, the rails then had a calculated compressive stress of 6·6 tons per sq. in., or a total load of 51·8 tons in each. This experiment seems to show that from the point of view of stability, there is no objection to the welding of long lengths of bull-head track.

Rail Joints

One of the difficulties in bull-head track is in obtaining a satisfactory design of joint. The ordinary British Standard design with 18-in. fishplates becomes dipped long before the rails are worn out. The moment of inertia of the rail is 34·7 in., whereas the inertia of the pair of fishplates is only 5·88 in., *i.e.*, 17 per cent. of that of the rail. A considerable improvement has been attained in the last few years by using short fishplates with only two bolts, enabling the joint sleepers to be brought closer together and giving more direct support to the assembly. Approximately 1,850 miles of L.M.S.R. track are now fitted with short fishplates.

The L.M.S.R. short fishplate for 95-lb. b.h. rails is 9 in. long, and the standard arrangement gives a sleeper spacing of the 12-in. × 5-in. joint sleepers of 1 ft. $2\frac{5}{16}$ in. centres. They are used in straight road, and curves down to a minimum of 40-ch. radius, except in tunnels or on water troughs.

In addition tests have been made with a close sleepered joint made of two 12-in. × 5-in. joint sleepers bolted together with $1\frac{1}{2}$-in. crossing bolts. The joint chairs are placed eccentrically on the sleepers to provide 1 ft. $1\frac{5}{16}$ in. between centres of chairs when using the 9-in. fishplate. These joints are slightly more difficult to pack that the standard arrangement, but they appear to stand up better under traffic in wet situations, such as near water troughs, and it is proposed to make them standard for wet formations.

In addition to the above types for standard rails, an extensive trial has been made of the Brogden joint, which is of the vertical scarved type, the rail ends being reduced to half thickness and lapping against each other. On the L.M.S.R. the length of scarf was 9 in. and the joint fitted with short fishplates and two types of washer plate. Subsequently the joints have been fitted with four-hole fishplates of standard length. Two tests have been made, one in an electrified line and one in steam. The first was near Bushey Station on a 98-ch. curve with $\frac{3}{4}$-in. cant. Traffic is 210 trains a day, averaging 220 tons in weight, with an average speed of 30 m.p.h. The joints were laid on November 24, 1935, with plain washer plates. Owing to difficulty in keeping the fishbolts tight, special 6-in. fishplates were fitted in June, 1936. The joints have given little or no trouble until recently when fatigue cracks were found in some of the fishbolts which had been in use about three years. This type of failure was suspected from the experience of the test in the steam lines mentioned below, so that a special lookout was kept for it. The joints are also showing signs of batter, so that the object of the design—noiseless running—is not being attained.

Tests on the steam lines began by laying rails sufficient to give 28 joints in Brent Bridge storage sidings in November, 1935, and as they showed no signs of distress under heavy locomotives, they were lifted and relaid in Willesden Low Level goods line in March, 1936, where they performed satisfactorily until 1937, when they were lifted and transferred to the up fast line near Cheddington in October, where this is a severe test, as speeds run up to 90 m.p.h., though the track is straight. After a few years' service, breakages of fishbolts became numerous. Inspection showed that movement was taking place at the joint with excessive stress on the bolts, the latter showing galling by the fishplates and the webs of the halved rails. The faces of the fishplates were also indented by the heads and nuts of the bolts. In addition, the inside faces of the halved rails were becoming worn at the top and bottom for about 1 in. in depth from the upper and lower surfaces of the rail. This was found to be due to the tightening of the fishbolt, bending the half rail in its depth. When the fishbolts were tightened, the half thickness rail web cambered in its depth to a maximum separation of 0·0085 in. To overcome this, washer plates, *i.e.*, fishplates planed so that they bed in complete contact with the web, were tried (14 joints being fitted in November, 1938) and although this prevented the flexing of the

rail webs, the excessive stress on the fishbolts remained, and failures continued. On the suggestion of the inventor, special plates and fishbolts were fitted, giving a cup-and-ball joint effect, but these did not reduce the stresses in the fishbolts sufficiently. A special inspection was made in April, 1939, both of the sections fitted with fishplates and washer plates, and as a result 18-in. fishplates were fitted throughout. The ganger reported that while the 2-bolt joints have given considerable trouble, when 4-bolt fishplates were fitted the joints have been easier to maintain to level than ordinary joints. Trains passing now make a tapping noise indistinguishable from that at ordinary joints. During the course of the experiments a special instrument was developed for recording the relative movements between the rails at a joint, and this gave the following results with standard bolts and nuts:—

	In.
With 2-bolt fishplate	0·034
,, ,, washerplate	0·041
,, ,, ,, with nuts slack ...	0·047
,, 4-bolt fishplate	0·022

With bolts and nuts having spherical seats the results were: —

	In.
With 2-bolt 7-in. fishplate	0·097
,, ,, 9-in. washerplate	0·062

Douglas Fir Sleepers

For many years the railways of Great Britain had drawn their sleeper supplies from the Baltic ports, but in recent years prices rose to such an extent that Douglas fir sleepers from British Columbia became competitive. Douglas fir is a more difficult timber to creosote than Baltic redwood, and its life in the track has in a number of instances been disappointing. In the middle thirties, a special investigation was made of a large number of Douglas fir sleepers that had been in the road for some time.

In 1920, the L.N.W.R. used a large number of Douglas fir sleepers, 101,400 being issued from Ditton creosoting depot alone. In 1934, 31 lengths of this input were located, and a careful inspection made of the 38,642 sleepers therein. The results of the inspection were:—

Sleepers	No.	Per cent.
Sound	24,360	63·1
Slightly split ...	11,576	30·0
Badly split ...	2,274	5·9
Decayed ...	331	0·8
Replaced ...	101	0·2
	38,642	100·0

To meet the possibility of ballast covering up defects, the sleepers of one rail length in each ¼ mile were removed from the road, but it was found that the percentage of sound or slightly defective sleepers was similar in both cases.

Since this inspection 17 lengths have been relaid, totalling 15,978 sleepers, with an average main-line life of 18 years, but there was no marked deterioration in quality since 1934. In some cases the sleepers were renewed because the rails had reached the end of their life, so that more than 18 years main-line life would have been given by the timber.

Tests with Flat-bottom Road

An extensive trial of flat-bottom road was begun in 1936, when 5¼ miles were laid in nine different places. They were grouped near London on the old Midland line, north of Leicester on the same line, and on the Caledonian main line north of Carlisle. In all cases B.S. 110-lb. flat-bottom rail was used, which has a head approximately equal in area to the 95-lb. R.B.S. The rails are of medium manganese steel and B.S. fishplates are used. The moment of inertia of the rail is 57·2 sq. in., and that of the pair of fishplates 12·35 sq. in., *i.e.*, 21·4 per cent. of that of the rail, which is more favourable than in the case of 95-lb. bull-head. For base plates, and fastenings of rail to baseplate and baseplate to sleeper, two main designs were got out, one based on German practice and one on American, both utilising a double shoulder plate.

German practice is represented by one type very similar to the Reichsbahn and another with a rolled steel plate on similar lines. The American types comprise one with a steel baseplate and another with a cast-iron plate, the rail fastenings in both cases being a mushroom-headed screw. In addition, two short lengths of American type baseplate were used, each fastened by three elastic spikes. In each position a length of not less than 440 yd. of standard B.S. track was laid at the same time as a control, and the maintenance gangers make special returns weekly of the amount of time spent on the flat-bottom and bull-head control lengths. In addition to lengths with the standard 24 sleepers per rail, a number were laid with 29 sleepers. Ignoring test lengths on which extraneous difficulties arose, it would appear from the table in the paper, showing man-hours per mile per annum, that, on the whole, f.b. track required less maintenance, both in regard to packing and fastenings, than standard chaired track. The most successful types of fastening, on this basis, were apparently the elastic spike and the German.

Extended Flat-bottom Rail Tests

After this test had been in progress for a little over two years, it was decided that further information was desirable, and another 12 lengths (6¾ miles) of 110-lb. and 8 lengths (5 miles) of 131-lb. flat-bottom rails were laid in 1939 in 17 widely distributed localities. The 110-lb. rail was the same as before, but whereas the 1936 rails all had the standard B.S. 4-hole fishplate 20 in. long, the 1939 rails had a modified section of plate utilising a 1-in. dia. nibbed fishbolt with B.S. fine thread, and three of the lengths had short 10-in. 2-hole plates of the same cross section. With the 20-in. plate the joint sleepers are at 2 ft. 1$\frac{3}{16}$ in. centres, and with the 10-in. plate 1 ft. 3$\frac{3}{16}$ in. The 131-lb. rails are of A.R.E.A. standard section with corresponding fishplates which are either 24-in. long with 4 bolts, 1-in. dia. or 36-in. long with 6 bolts, 1-in. dia. With the 24-in. fishplate the joint sleepers are at 2 ft. 5$\frac{3}{16}$ in. centres except for a few which are close-sleepered, and in the 36-in. plate the centres are 2 ft. 0$\frac{11}{16}$ in. The 131-lb. rails are of medium manganese steel, B.S.S. No. 9 (1935). The fishplates are of Class B steel B.S.S. No. 47 (1928) but with the carbon content raised to 0·36-0·44 per cent. The 10-in. fishplates for the 110-lb. rails and all those for the 131-lb. are oil hardened. The steel baseplates are also of Class B steel B.S.S. No. 47 (1928). The moment of inertia of the 131-lb. rail is 88·5 sq. in., and of the pair of fishplates 32·2 sq. in., *i.e.*, 36·4 per cent. that of the rail.

In 1936 the rails were laid with normal expansion, but in 1939 the expansion was reduced practically 50 per cent. below standard. An R.B.S. 95-lb. standard control length (at least ¼-mile long) was laid at the end of the flat-bottom road and at the same time. In the latter test only two main types of baseplate were used, one of a modified German design but using a cast-iron plate, permitting the use of standard chair screws and ferrules, and the other using three elastic spikes, two spikes on the inside and one on the outside of the rail. Half of these baseplates were cast iron and half of rolled steel. In the 1936 test the elastic spikes were one inside and two outside the rail. The alteration was made as a result of the tests on resistance to lateral loading tests referred to in Part I of this article. The sleepering was either 24 or 26 per rail length.

Comparative Costs

A table of figures (presented with the paper) comparable with that covering the earlier experiment, but over shorter periods, ranging from 36 to 104 weeks, gives somewhat indeterminate results. Packing probably comprised the original time spent in getting the road to a bearing. As would be expected from the greater lateral stiffness, the flat-bottom rail required generally less lining; but when it did require this, the additional stiffness caused it to cost more. The fishplates and fishbolts took more labour to oil and put on, but it is a question whether it is necessary for this to be done to the same extent as in B.S. road.

Mr. Wallace has no doubt that to get accurate comparative figures of maintenance, it would have been better to have special technical staff detailed to check the charging of the time currently, but this was not feasible. It does seem that f.b. road requires less day-to-day maintenance than the bull-head, and had it not been for the intervention of the war, it was proposed to relay in their entirety some lengths with f.b. road, and then definitely check up on the man-hours required for the various jobs. The present arrangement with both types on lengths tends to give incorrect figures, *e.g.*, in summer time the extra walking of lengths to see that keys are tight is returned, whereas an f.b. road required no such attention.

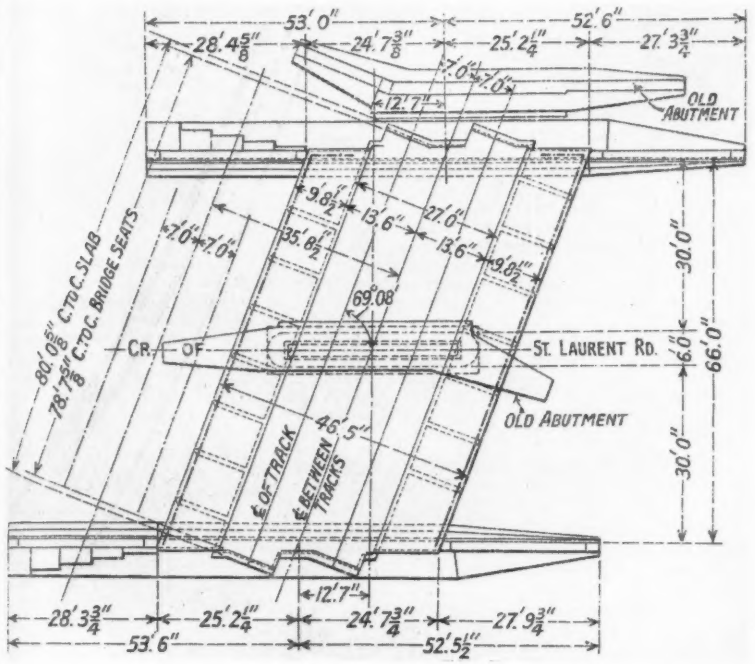
In 1939, the cheapest type of flat-bottom road was the 110-lb., with cast-iron baseplate and elastic spike fastenings. This cost approximately 6½ per cent. per mile more than the standard track; but if the flat-bottom had been the standard track, some of the components would have been supplied at a less price than for the small orders given, and the price of the rolls would have been spread over a much larger tonnage of rails. Similarly, the cheapest design using 131-lb. rail also had cast-iron baseplates and elastic rail spikes and cost approximately 30 per cent. more than standard bull-head, and the same comment can be made in this case. The rolled-steel baseplates were a costly item, being approximately 115 per cent. more expensive than the cast-iron chair. Presumably this is the item where bulk orders would procure the greatest reduction in price, but at any rate the cast-iron baseplate gives quite satisfactory service.

Some months after the 131-lb. rail was laid it was noticed that at the joints at the running-on end of the rails were battering about 1 in. from the ends. This did not occur in the sorbitic rails. To prevent this the rail ends have been hardened in the track by means of an oxy-propogas flame and water quenching. The hardening extends 2 in. from the running-on end only. The Brinell number of the rail head originally was 220-240, and this has been increased to 300-350. No such defect has developed in the 110-lb. rails.

Large Pre-Cast Slab Concrete Bridge, C.N.R.

A description of the replacement of a steel-girder bridge by a continuous reinforced-concrete span of four 80-ft. parallel slabs

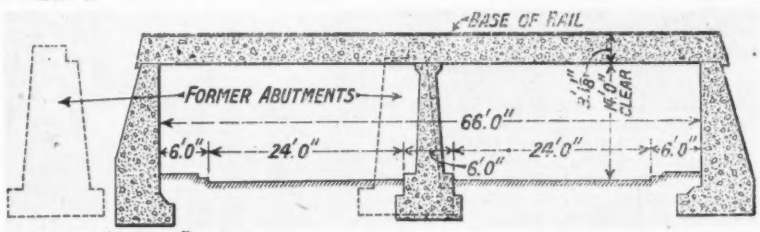
A NUMBER of problems had to be solved by the Canadian National Railways engineers at a point some seven miles outside Montreal, where a double-track section of their system crosses over a highway on which traffic has been increasing rapidly of recent years. First, the roadway under the bridge had to be widened from about 40 ft. to 66 ft., and the new bridge had to carry platforms alongside each track. The position of the bridge had also to be shifted somewhat, longitudinally to the railway, and had to be constructed on a skew of about 68 deg. Most important of all, neither rail nor road traffic could be interrupted for more than a very short period without great inconvenience. Accordingly, it was decided to replace the old through-girder steel span with very large pre-cast reinforced-concrete slabs forming a continuous span with a central concrete pier between the two lanes of road traffic. It is believed that these slabs, each of which weighs some 120 tons, are the heaviest yet used. There are four of them and each is about 80 ft. long to allow for the skew, and each carries a rail secured to it by malleable iron chairs, the bolts of which are cast into the slab. Each of the two inner slabs is 7 ft. wide by 3 ft. deep, and each outer one has a main part 6 ft. 7⅝ in. by 3 ft. with cantilever brackets projecting 9 ft. from it to carry one of the platforms. The total width of the bridge is thus 46 ft. 5 in.

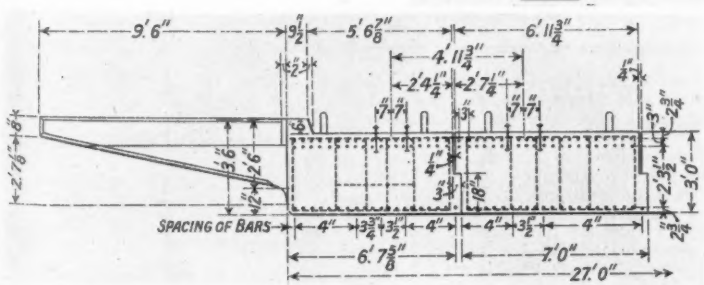


Above: Plan of the bridge

Right: Longitudinal section through bridge

Below: Section through a pair of slabs





The realignment necessitated the construction of a western abutment well clear of the old bridge, but the old western abutment occupied almost the same spot upon which the new pier had to be built. The old span was, therefore, temporarily carried on falsework while the old abutment was demolished and the new pier constructed. This falsework comprised four timber towers consisting of two trestles each, carrying I-beam stringers supporting the tracks on wooden sleepers. The three easterly towers were first erected, while the east abutment continued to support the track. The new east abutment was then cast *in situ*, and the excavation for the roadway was completed between towers Nos. 2 and 3.

Subsequently, the westerly tower was erected and the falsework carried over to it, after which the old east abutment was removed and the new pier constructed. Tower No. 4 was then shifted nearer the pier to allow of two road traffic lanes of reasonable width to be used. Both new abutments and the pier were founded on rock a few feet below the road surface.

Meanwhile, the slabs were being cast at a point near the bridge, and so carefully was this done that they were within $\frac{1}{16}$ in. of the clearances provided for them on the abutments. To insure that each slab should fit snugly against the next, one outside slab was first cast, and, after the removal of the side form, the adjoining slab was cast in its relative position against the first.

The placing in position of the slabs was carried out between trains one track at a time as follows. Traffic was first diverted over the north track and the permanent way and decking of the south track removed. The outer pre-cast slab was then run out on a flat truck from the casting yard and placed in its final position with two 150-ton cranes. The inner south slab was next similarly dealt with, the placing of each slab taking only about 20 min.

A strip of lead sheeting was placed on the footing joint cast half-way down the depth of the two slabs where they dovetail into one another along the longitudinal centre line of the track, and the joint between the slabs was filled with oakum and asphalt mastic. In addition sheet-lead flashings previously let into the slabs 3 in. below the top surface were bent over to meet each other and their edges soldered together and beaten down to provide a smooth surface. The spaces between the slabs and the ballast walls were also caulked with oakum soaked in a bituminous compound and then filled with asphalt mastic. After the southern track had been laid, traffic was diverted over it and the northern half of the bridge similarly treated.

The superstructure was erected by the C.N.R. construction staff, and the structure was designed by the Bridge Department of the Central Region, C.N.R., under the supervision of Mr. C. P. Disney. We are indebted to *Concrete* for the drawings reproduced.

Ministry of Supply "Austerity" Locomotives

A simple 2-8-0 design combining efficiency and economy of production. All renewable parts are duplicated with those of L.M.S.R. standard locomotives

ORDERS for a considerable number of two-cylinder 2-8-0 type locomotives have been placed by the Ministry of Supply with British locomotive firms, and to these the term "Austerity" has been applied. The illustrations reproduced show them to be of simple and robust design, and every care has been taken in working out the details to make sure that economy in labour and material should be realised to the greatest possible extent. The engines will be capable of hauling loads of 1,000 tons, and will be employed for hauling heavy freight trains and military traffic of various kinds.

As the illustration shows, the locomotive conforms fairly closely to the standards usually adopted on British railways for this class of engine. It has two outside cylinders driving the third pair of coupled wheels, and Walschaerts motion is employed for actuating piston valves working above the cylinders; these valves are arranged for inside admission. The control of the valve gear is effected by hand-screw reversing gear arranged for left-hand drive. It is of interest to note some of the particulars relating to the locomotives, keeping in mind the efforts that have been made to simplify matters and reduce the time and cost of production. The pistons are of the box type, each having three narrow rings of cast iron; the piston rod is of steel and secured by a cotter to the crosshead; the connecting and coupling rods are of steel and of the non-adjustable type. Bushes for the gudgeon pins are of bronze and those for the crank pins of gunmetal lined with white metal; they are of the solid non-adjustable type pressed in and secured by a key. The driving-wheel centres take the form of steel castings, but those of the leading, intermediate, and trailing wheels are of cast iron, all with balanced weights incorporated in the castings. The employment of steel castings is strictly limited and complicated forgings avoided wherever possible. Indeed, the constructional details of the locomotive have been reduced in number to the lowest limit consistent with efficient working, no provision has been made for spring adjustment, and as far as possible renewal parts are duplicate with those of L.M.S.R. standard locomotives. Steel tyres are fitted to the coupled wheels only; the crank pins are steel forgings suitably heat-treated.

The main frames are manufactured of steel-plates with stretchers formed of flanged plates and fabrications; the smokebox saddle is of cast iron. In preparing the frames all holes are marked from one template for drilling and reamered out to exact size when the respective pieces are put together. The stretchers are secured to the frames either by turned and tightly-driven bolts, or by steel rivets closed by hydraulic pressure.

Boiler Details

The boiler barrel and firebox casing are built up from steel plates of boiler quality, with longitudinal seams jointed with outside and inside butt straps, and all rivet holes drilled. The boiler barrel is parallel, and the firebox casing of the round-top type. The inner firebox is of copper and stayed to the outer casing by steel water-space trays riveted over on the inside only, also by copper stays in the breaking zone, riveted over both inside and out. The crown of the firebox is supported by steel direct stays screwed and riveted over at both ends. The junction of the inner firebox plate with the outer shell at the firehole is made by flanging both plates outward; the foundation ring is forged of steel and machined where required.

The boiler tubes are of steel and the ashpan is constructed of welded steel plates. The firebars are of cast iron. The smokebox is of circular form manufactured from mild-steel plates.

Many of the foregoing details may be considered common practice in building locomotives, and attention has been called to them only so that readers whose interest is mainly centred in the methods of simplifying construction and economy in time, labour, and materials, may have information as to some of the details of construction followed.

The boiler and firebox shell are fitted with crinolines of steel bar on which the steel clothing sheets are laid; asbestos millboard is fitted at the back of the firebox. The cylinders are clothed with steel sheets and lagged with plastic magnesia.

Main Particulars

The following are the main particulars of the locomotive:—

Cylinders (2) dia.	19 in.
Piston stroke	28 in.
Wheels, coupled, dia.	4 ft. 8½ in.
Wheels, leading truck, dia. ...	3 ft. 2 in.
Wheelbase, coupled	16 ft. 3 in.
Wheelbase, total	24 ft. 10 in.
Boiler, heating surface, large tubes	451 sq. ft.
Boiler, heating surface, small tubes	1,061 ,,
Firebox	168 ,,
Combined heating surfaces ...	2,018 ,,
Total (evaporative)	1,680 ,,
Superheater surface (in.)	338 ,,
Grate area	28·6 ,,
Boiler pressure	225 lb. per sq. in.
Tractive force (85 per cent. b.p.) ...	34,215 lb.
Weight of engine in working order	72 tons
Weight of tender in working order	56 ,,
Total weight of engine and tender is	128 ,,
Of this 62 tons is available for adhesion.	

The cab is built up of steel plates of rigid construction with joints so arranged as to be easily dismantled. Hinged windows are fitted in the front plate, and a rectangular opening cut in the sides of the cab, but sliding windows or shutters are not fitted. Seats are provided for the driver and fireman. Steam sanding is arranged at the front of the leading, and the front and rear of the driving wheels, and the buffers and drawgear follow usual practice; between the engine and tender, in addition to the drawgear and safety links, spring-loaded intermediate buffers are fitted, also intermediate buffing blocks.

The two-wheel truck at the front end of the engine is of the three-pin swing link type. The frames are of steel plate with cross stretchers of the same material, and the wheels which also incorporate the tyre section are of disc form and made of steel forged and rolled. The truck axleboxes are of bronze with guides of cast iron. A sight feed lubricator with four feeds is used for lubricating the cylinder barrel and steam pipes, and other important points requiring lubrication are syphon fed. A steam brake is fitted to the engine, also Westinghouse and Vacuum automatic brake apparatus for train working. Some of the engines are being fitted with carriage warming apparatus.

The Tender

The tender is of the eight-wheel non-bogie pattern with disc wheels incorporating the tyre section and made of cast-iron chilled on the tread. The tender frames are constructed of steel plates rigidly stayed together by plates and fabricated stretchers; the axleboxes are of cast iron and fitted with gunmetal bearings filled with white metal. All the wheels of the tender are braked by steam and hand brakes, and Westinghouse and Vacuum automatic brake apparatus is fitted for train working; the brake rigging is compensated. The tender tank is formed of steel plates and is of welded construction throughout. The tank, framing, stretchers, and so forth, are so designed that water pick-up gear may be fitted later if desired. A simple form of water gauge comprising stop cock and perforated-gauge tube is placed outside the tank on the front-end plate, and the fuel space is so arranged as to make the bunker self trimming.

It is expected that some of the locomotives will be delivered this year and this may be regarded as a notable achievement in view of the fact that the design was completed, and all materials ordered within five or six weeks

A general view of the locomotive and a diagram showing the principal dimensions and weights of the engine are given on the opposite page.

DIRECTION OF THE HAND TOOL INDUSTRY.—The Ministry of Supply states that it has been evident for some time that an extension of the functions of the Directorate of Hand Tools was likely to take place so that the production, provision, and distribution of hand tools, not only for Service requirements which have for long been co-ordinated, but also for the essential needs of the country should be directed and so far as necessary controlled in the national interest. Accordingly, the Directorate of Hand Tools in the Department of the Director-General of Equipment & Stores, Ministry of Supply, will take over planning the production of all hand tools.

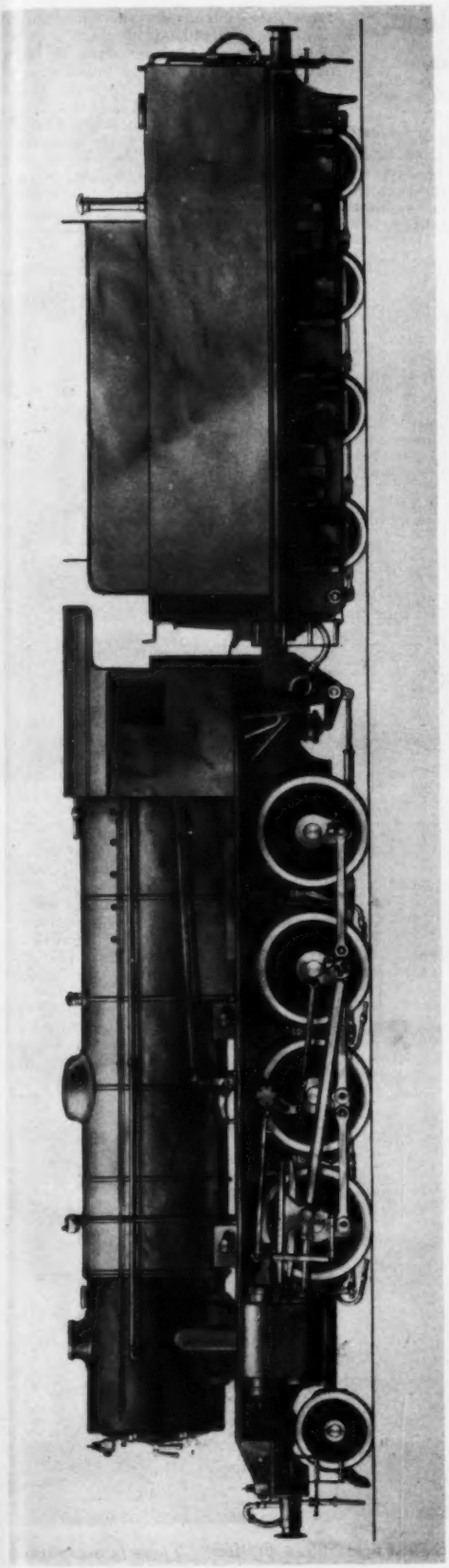
Production plans will be worked out for the various sections of the industry and steps will be taken as necessary to correct defects in distribution. The Director of Hand Tools will be assisted by advisory panels and will have the collaboration of qualified honorary advisers.

The following have been appointed as honorary advisers and as Chairman of the relative advisory panels:—

Engineers and mechanics' tools	Mr. Horace Hampton.
Agricultural and heavy edge tools	Mr. Peter Boulton.
Files and rasps...	Mr. Lewis Davies.
Carpenters' and light edge tools	Mr. Philip Davidson.

The Director of Hand Tools will have a Central Advisory Committee of which he will be Chairman composed as follows, which will advise him on questions of general policy affecting the industry:—

Mr. H. A. Pendergast (Deputy Chairman).
Mr. Horace Hampton.
Mr. Peter Boulton.
Mr. Lewis Davies.
Mr. Philip Davidson.
Mr. A. H. Godfrey.
Government representatives.



General view of the Ministry of Supply 2-8-0 "Austerity" locomotive

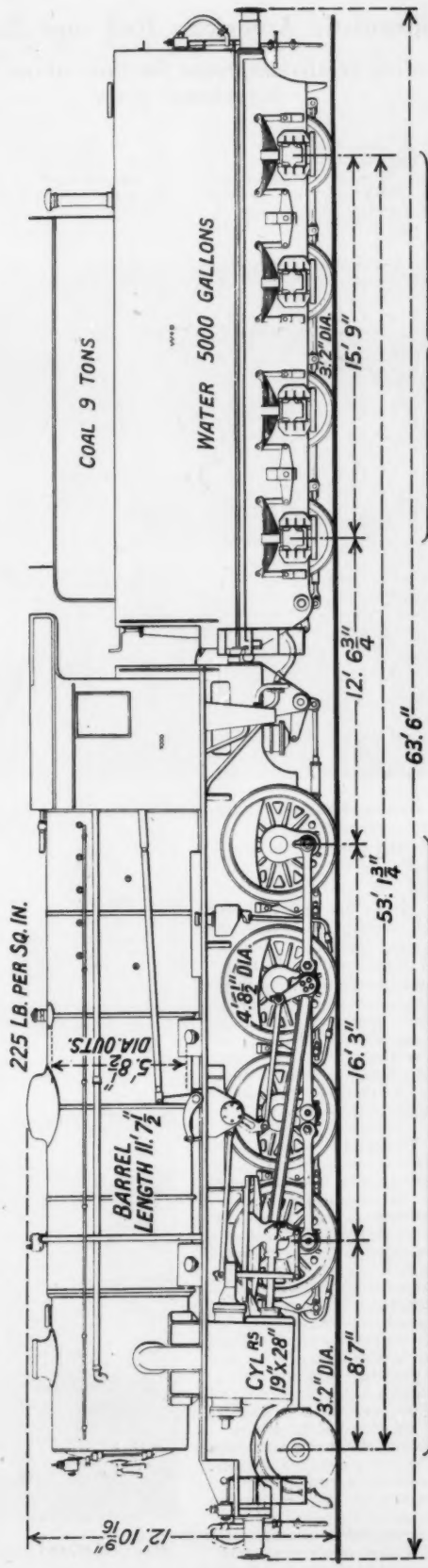


Diagram showing the principal dimensions and weights of the Ministry of Supply "Austerity" 2-8-0 type locomotive

(See article on opposite page)

A Modernistic American Rail and Bus Station

Affording greatly-improved facilities at an important interchange point

THE Denver & Rio Grande Western Railroad has recently erected at Salida, Colorado, a town situated well up in the Rocky Mountains on the main line, a new rail and bus station built and equipped on modernistic lines. This station has taken the place of old multi-gabled, one-storey stone station buildings built more than 50 years ago, and, in addition to providing some much-needed improved facilities at this point, will, it is estimated, have cost no more than would have been involved in reconstructing the older buildings on improved lines. Salida has a population of approximately 5,500, and is the centre of an attractive mountain district bringing considerable traffic to the railway. All passenger trains stop there as it is a junction point with the railway company's narrow-gauge lines leading to the west and south.

The new station, situated a little more than 100 ft. from the nearest point of the old station, is not large—it has an overall size of 99 ft. by 50 ft.—but, in addition to providing passenger facilities, it also houses a number of offices which formerly were located in a nearby company-owned hotel and annexe building. It is built as a two-storey structure with rectilinear architectural lines except for a large protruding one-storey, semi-circular bay at one end, housing the waiting-room. It is of fireproof brick construction, painted white with blue pointing, window sashes, and doors. In keeping with and adding to the general architectural theme, a neon sign is mounted on the roof of the one-storey section facing the town with the words "Rio Grande" in "speedlined" letters.

The most significant feature of the interior of the station is the extent to which the modernistic theme of the exterior has been incorporated, as expressed principally in plain, unembellished walls, a variety of colours, and fluorescent lighting. In the waiting-room settees with red-leather upholstered seats and backs line the curved wall of the room beneath a succession of six large steel-sash window openings; the windows form a continuous panel and provide a vista through an arc of more than 120°. The windows are fitted with Venetian blinds.

The two ticket offices in the waiting-room, one for the conduct of railway business and the other for handling the motorway business, are located in opposite corners of the room, and are unique in that they are merely open working areas enclosed by open-top counters. Elsewhere on the main floor the station provides a number of additional facilities. Heating of the building is by steam; concealed radiators are used throughout the public areas and exposed floor-type radiators elsewhere. Steam for the system is furnished by the railway company's existing boiler plant so that no separate heating plant is required in the building.

The road vehicles which serve the district are enabled, under the new arrangement, to link up with the station adjacent to the platforms. They are operated by Rio Grande Motorway Incorporated, a subsidiary of the railway company. Formerly the bus station was housed in cramped inadequate quarters in the business section of the town some little distance from the railway station and these facilities were abandoned when the new passenger station was brought into service. Thus today, in an unusually effective arrangement of rail and bus station co-ordination, passengers of both services are offered maximum convenience and comfort in station facilities for arrivals, departures, and interchange.

The photographs reproduced on this page showing the exterior and interior of the new station are from originals kindly supplied to us by our American contemporary, the *Railway Age*.

New rail and bus station at Salida, Colorado, on the Denver & Rio Grande Western Railroad

Rail-ticket and enquiries counter at new Salida Station. There is a separate counter or bus passengers

RAILWAY NEWS SECTION

PERSONAL

Mr. H. J. Humphrey, Vice-President & General Manager, Eastern Lines, Canadian Pacific Railway, has been appointed to be Vice-President of C.P.R. lines east of the Great Lakes, and to assist in arrangements for meeting the wartime demands on the company's organisation in Eastern Canada. Mr. E. D. Cotterell, General Superintendent, Calgary, has been appointed General Manager of lines east of the Great Lakes.

INDIAN RAILWAY STAFF CHANGES

Mr. H. N. Parker has been confirmed as Deputy Chief Commercial Manager, B. & A.R.

Mr. V. P. Bhandarkar, Central Publicity Officer, State Railways, has been appointed to officiate as Deputy Chief Transportation Manager, B. & A.R., as from June 13.

Mr. A. R. Soofi has been appointed to officiate as Director of Finance, Railway Board, as from June 29.

Mr. W. B. Burford has been confirmed as Deputy General Manager (Works), G.I.P.R.

Mr. F. P. Vandertaelen has been appointed to officiate as Deputy General Manager (Staff), G.I.P.R., as from May 18.

Mr. S. M. Basrur has been appointed to officiate as Deputy Traffic Manager (Rates & Claims), G.I.P.R., as from May 18.

Mr. J. B. Remington, V.D., has been confirmed as Chief Transportation Superintendent, G.I.P.R., as from May 31.

Mr. H. B. Adams has been appointed to officiate as Chief Electrical Engineer, N.W.R., as from June 15.

Khan Bahadur A. L. Sheik has been appointed to officiate as Deputy Chief Engineer, N.W.R., as from June 13.

Mr. E. M. Egan, officiating Deputy Chief Commercial Manager, N.W.R., has been appointed as an Officer on Special Duty under the Railway Board, as from July 6.

Khan Bahadur A. K. Nawabzada has been appointed to officiate as Deputy Chief Commercial Manager, N.W.R., as from July 4.

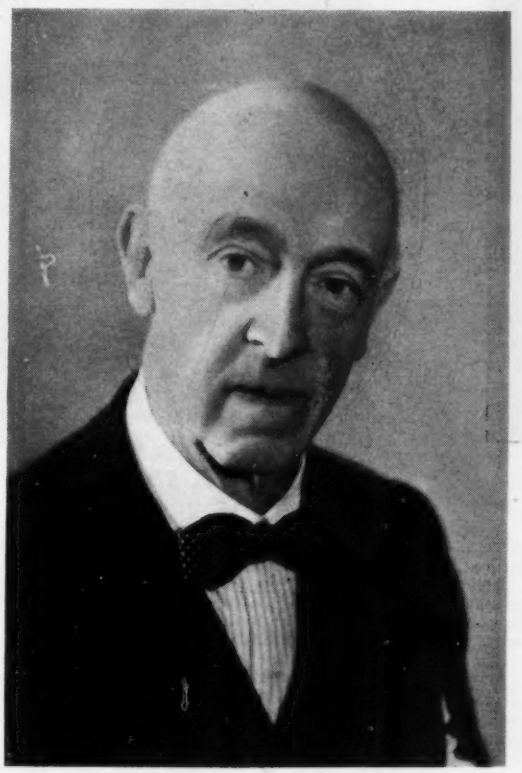
Mr. T. .. Robinson has been appointed to officiate as Deputy Chief Mechanical Engineer, N.W.R., as from July 1.

Mr. P. C. Taela has been appointed to officiate as Divisional Superintendent, N.W.R., as from June 1.

Dr. H. J. Nichols has been appointed Deputy General Manager (War Planning), B.B. & C.I.R., as from May 20.

Mr. E. E. Bowden, Stationmaster, Exeter Central, Southern Railway, was presented on November 5 with the company's Merit Diploma for exceptional bravery and devotion to duty during the heavy air raid on Exeter. The staff also were complimented for their co-operation. On this occasion also Major F. Galliford (Southern Railway Home Guard), and Porters A. F. Frampton and W. A. Passmore, all of Barnstaple Station, were presented with cheques in recognition of their prompt action in saving a passenger who accidentally had fallen on the line in front of a train.

Mr. Fulwar Cecil Ashton Coventry, O.B.E., M.Inst.A.E., M.Inst.T., Superintendent of Road Transport, Great Western Railway, retired from this position on October 31, but is retaining the various directorships which he holds in railway-associated omnibus and road transport companies. Mr. Coventry was born in 1874 and entered the Swindon Works of the G.W.R. as a pupil in 1893. After some time spent in the drawing office, he became an Inspector of Materials, and subsequently was appointed Assistant to the Carriage Works Manager. When the G.W.R. decided to establish a Motor Department to include both goods vehicles and passenger buses, Mr. Coventry was associated with the venture from its inception. He was responsible for the establishment of the first bus service of the G.W.R., which was inaugurated on August 17, 1903, between Helston and the Lizard. In 1904 Mr. Coventry was transferred to the Traffic Department, more particularly in connection with road motor services, and in the course of years he made this section peculiarly his own. He was a Founder Member of the Society of Motor Omnibus Engineers, which, during its comparatively short career from about 1903 to 1907, played no unimportant part in the development, as a practical and reliable vehicle, of the omnibus, for both urban and interurban services. Mr Coventry was also a member of the committee which founded the Commercial Motor Users' Association in 1903 to watch over and protect the interests of users of commercial motor vehicles; in addition, he was a member of Council of the Institution of Automobile Engineers in its early years, and assisted in the re-construction of the Institution of Automobile Engineers when it moved its headquarters from Birmingham to London. In 1912, Mr. Coventry was transferred to Paddington as an Assistant to the Superintendent of the Line. In November, 1915, his services were loaned to the Ministry of Munitions; he worked in the Munitions Inland Transport Department as Deputy to Mr. Howard-Williams (now Chairman of the Central Argentine Railway Limited), and eventually succeeded him when Mr. Williams was transferred to the Coal Controller's Department. For his war services he was given the honour of O.B.E. On returning to railway service, Mr. Coventry was appointed Assistant Superintendent of the Line, G.W.R., in May, 1919, and held this position until his appointment as Superintendent of Road Transport, with headquarters at Paddington, in January, 1922, an appointment which was then of particular significance in view of the extensive road motor facilities then being developed by the G.W.R. More recently, since the granting of general road powers to the British main-line railway companies, many of these road transport activities have been transferred to associated companies in which the G.W.R. holds substantial financial shareholdings. Mr. Coventry represents the G.W.R. on the boards of many of these undertakings, and his directorships include the Crosville Motor Services Limited, the Western Welsh Omnibus Co. Ltd., the Bristol Tramways & Carriage Co. Ltd., the City of Oxford Motor Services Limited, and Sutton & Co. Ltd. He is also a Member of the Standing Joint Committee in connection with the Thames Valley Traction Co. Ltd., a Member of the Bristol Transport Joint Committee, and has recently been appointed a Member of the new Plymouth Transport Joint Committee. Mr. Coventry represented the General Manager of the Great Western Railway on the Road Transport (Defence) Advisory Committee, and on the outbreak of the present war he was appointed by the Railway Executive Committee to be Chairman of the road committee set up to deal with all matters affecting road transport. He was also a member of the Central Road & Rail Conference. He has been a Member of the Institute of Transport since January, 1931, and has served as a Member of Council.



Mr. F. C. A. Coventry, O.B.E.
Superintendent of Road Transport, G.W.R., 1922–42

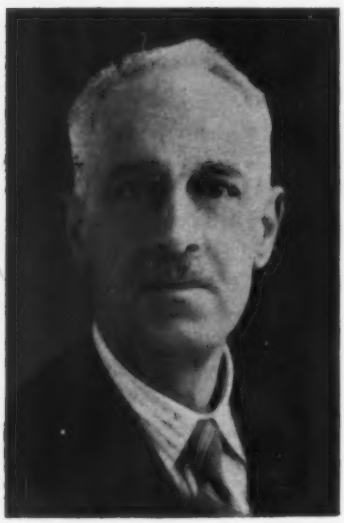
Mr. F. H. Marshall, Goods Agent, Nine Elms, Southern Railway, who, as recorded in our November 13 issue, has been appointed Assistant London District Freight Superintendent, commenced his railway career with the former London & North Western Railway, and entered the service of the late South Eastern & Chatham Railway in 1910. After holding the position of Chief Clerk to the London District Goods Superintendent, he went to Bricklayers

Arms as Acting Goods Agent in 1917, and was appointed Goods Agent, Nine Elms, in March, 1929.

Mr. G. H. Skelton, Assistant to Chief Accountant, L.N.E.R., who, as recorded in our November 6 issue, has been appointed Assistant Accountant, commenced his railway career with the former Great Northern Railway at Keighley Goods Depot. In August, 1902, he was transferred to the Accountant's Department, Kings Cross. After service with the Armed Forces from 1916-19, he became, in February, 1920, Assistant Book-Keeper, which position he held until 1932, when he was appointed Chief Book-Keeper. Mr. Skelton became Assistant to the Chief Accountant in January, 1936.

Mr. J. A. Warren-King, District Goods Manager, Worcester, G.W.R., who, as recorded in our November 6 issue, has been appointed District Goods Manager, Birmingham, joined the railway in 1902, and was attached to the General Manager's Office. After gaining experience in most sections and taking charge of the statistical and general sections, he went to France as an R.T.O. in April, 1915, and was demobilised in February, 1920, with the rank of Major. In March, 1924, Mr. Warren-King was attached to the Royal Commission which visited and reported on the New South Wales and New Zealand Government Railways, and, at the request of the New Zealand Minister of Railways, remained in that country an additional three months to introduce up-to-date statistical methods upon the Government Railways. Then in March, 1927, he went to Nyasaland with the Royal Commission that reported on lines of communications and the possibilities of a bridge over the Zambesi. In December, 1928, Mr. Warren-King was appointed Assistant & Chief Clerk to the London District Goods Manager, G.W.R., and in May, 1931, became Goods Superintendent at Hockley, Birmingham. In October, 1935, he was appointed Assistant District Goods Manager, Birmingham, and shortly afterwards became District Goods Manager, Worcester.

Mr. T. H. Hollingsworth, Assistant District Goods Manager, Cardiff, G.W.R., who, as recorded in our November 6 issue, has been appointed District Goods Manager, Worcester, entered the company's service at Cardiff Goods Station in 1913. He served with the Armed Forces from 1915-19, after which he returned to Cardiff. In 1923 he was selected for special training under the General Manager's scheme, and obtained experience in goods, traffic, and docks departments, including headquarters. He completed the special training in October, 1927, and, after a period of service at Aberdare, served in various departments of the Chief Goods Manager's Office from 1929-31. He was transferred to the District Goods Manager's Office at Swansea in January, 1932, and from July of that year until October, 1936, served on the Staff Investigation Committee (Indoor & Outdoor Staff); from 1934-36 he was Chairman of this committee. In November of the latter year he became Chief Clerk, Development Department, Chief Goods Manager's Office, and in 1938 was appointed Assistant District Goods Manager, Cardiff.



Mr. G. H. Skelton
Appointed Assistant Accountant, L.N.E.R.

Mr. J. A. Warren-King
Appointed District Goods Manager, Birmingham, G.W.R.

Mr. T. H. Hollingsworth
Appointed District Goods Manager, Worcester, G.W.R.

Mr. J. S. Wills has resigned from the board of directors of the Eastern Counties Omnibus Co. Ltd. Mr. P. G. Stone-Clark has been appointed a Director.

We regret to record the death on November 7 of Mr. J. T. Drennan, who had acted since 1930 as Secretary to the Railway Tribunal in Eire.

Mr. E. Greenhalgh, who, as recorded in our November 13 issue, has retired from the position of Assistant for Outdoor Machinery to the Chief Engineer, Southern Railway, served for ten years with the former Great Northern Railway before being appointed Assistant to the Electrical Engineer of the late London, Brighton & South Coast Railway in 1909; later he became Electric Light & Power Engineer of the latter company. During the war of 1914-19 he served as a Lieutenant (Electrical Officer), R.N.V.R., after which he returned to his railway duties; and in 1923 he was appointed to the position from which he now retires. Mr. Greenhalgh is an Associate Member of the Institution of Electrical Engineers; a Member of the Assistant Railway Engineers' Association; a Member of the Batti Wallah's Society (Seagoing Electrical Engineers); and a Fellow of the Permanent Way Institution. On October 22 a presentation was made to him by Mr. G. Ellson, C.B.E., Chief Engineer, Southern Railway, on behalf of his department.

The Minister of War Transport has appointed Mr. T. Macpherson to be Regional Port Director for Scotland, in succession to Mr. Robert Letch.

Mr. Robert Dixon was presented recently with an inscribed gold wrist watch by his colleagues, on his relinquishment of the position of Dock Manager, Flymouth, G.W.R., to become Assistant to the Chief Docks Manager, Cardiff.

Mr. J. F. McCormick, Chief Clerk to the General Manager, Great Northern Railway (Ireland), has been appointed Assistant to the General Manager.

We regret to record the death of Major A. S. Rice, M.C., Royal Engineers, who was well-known in engineering circles in Greece and the Middle East. One of his most important supervisory undertakings was the construction of the 600-mile pipeline in Iraq for the Iraq Petroleum Co. Ltd.

Mr. J. H. Harley-Mason is to retire from the position of New Works Engineer, L.P.T.B., on December 31.

A presentation was made, on the occasion of his recent marriage, to Mr. F. H. Hartnell-Smith, Chief Accountant, Great Southern Railways, Eire. The presentation, which took the form of a pedestal canteen of cutlery, was made by Mr. A. Malcolm, on behalf of the staff at Broadstone.

South African Staff Changes

Mr. P. J. Louw, System Engineer, Johannesburg (Acting System Manager, Windhoek), South African Railways & Harbours, to be Inspecting Engineer, Chief Civil Engineer's Office, Johannesburg.

Mr. S. P. Havenga, Assistant Superintendent (Operating), Johannesburg, to be Superintendent (Operating & Commercial), Kimberley.

TRANSPORT SERVICES AND THE WAR—166

All Traffic to be "Carriage Paid"

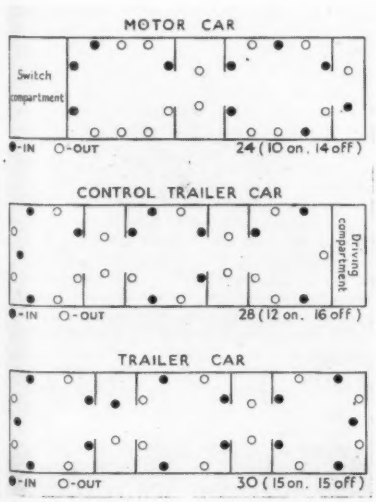
As from January 1 next, all goods traffic sent by rail, with the exception of cattle, sheep and pigs, and fresh fruit and fresh vegetables, will be required to be sent "carriage paid." This means that the consignor will be responsible for paying the carriage charges at the forwarding station, but does not necessarily involve pre-payment. The exceptions are temporary, and it is hoped to bring all traffic within the scope of the Order as soon as arrangements can be made to overcome the special difficulties in these cases. This decision has been taken by the Minister of War Transport to save railway man-power and to relieve the strain on railway staff arising from the growing volume of war traffic. Merchandise traffic by passenger train and about three-quarters of the traffic by freight trains is already sent "carriage paid." By discontinuing the practice of having goods sent "to pay" in the case of the remaining portion, some hundreds of railway clerical and accounting staff will be freed for other work.

Bread Transport Restrictions

Substantial economies in transport are expected by the Ministry of Food to result from the extension to the whole country of restrictions on bread deliveries by wholesalers. These have been tested in the North West Area, comprising Cumberland, Westmorland, Lancashire, and Cheshire. The scheme applies to bread, cake, and flour confectionery. Retailers of these must nominate not more than two wholesalers from whom they may in future draw supplies, preferably those nearest to them. Registrations must be completed before January 17. In the North West Area, where some 35,000 retailers have been affected, calls by wholesalers have been approximately halved.

Underground Train Lighting

To save fuel, lighting on London Transport Underground trains has been cut by over fifty per cent. The accompanying diagram shows the manner in which the problem of reducing the number of lights in the cars was met. On all except the most modern stock, the lamps are arranged five in series so that they can be supplied from the traction current, which is 600 volts. Consequently, to reinstate one lamp would mean four others would have to go on and, similarly, to extinguish one further lamp would mean that four others would be extinguished also. The work involved in rewiring the lamps to alter the position of the series is too considerable to be undertaken in wartime. By careful selection, however, it was found possible to obtain a fairly uniform distribution of the remaining lamps. The diagram shows the arrangement in various types of car of the particular rolling stock employed on the Central London Line. All Underground cars have now been dealt with.



Arrangement of reduced lighting on London Transport Underground trains

Women Bus Drivers

It was officially announced recently that women bus drivers are to be trained to take over from men in Bristol, after all vacancies for conductresses have been filled. Very few women have so far been taken on for such work in any part of the country, partly because such a move is not popular with the men, so long as any man is available, but chiefly because the work is heavy and few women are physically capable of it. The supply of bus drivers appears to be fairly satisfactory, as some men have been released by the Army and the R.A.F., and all fit conductors who have not been called up are being trained as drivers.

The Bus Curfew

The bus curfew to which we made reference in our October 23 issue (page 401) has now been, or is being, extended to many of the Regional Transport Areas.

North-Eastern Region.—From November 1, general bus services have ceased running after 9 p.m., and Sunday services do not operate before 1 p.m. Buses of such operators as the Leeds City Transport Department and the West Yorkshire Road Car Co. Ltd., which leave town termini after 9 p.m. carry only workpeople holding priority travel permits. Some towns, including Halifax, had in pre-war days no general Sunday bus service before 1 p.m.

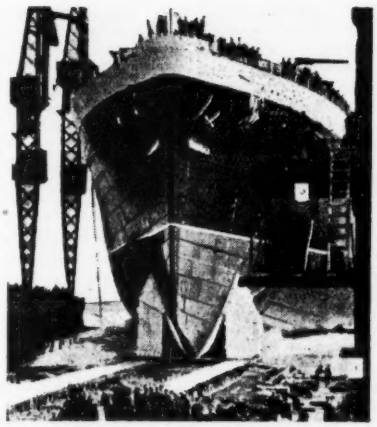
Northern Region.—From November 1, the 9 p.m. bus curfew has applied generally; on Tyneside, Wearside, and Teesside the hour is 10 p.m. There will be no general Sunday services before 1 p.m. from December 6.

North-Midland Region.—The 9 p.m. curfew for large towns (8 p.m. in smaller towns of under 20,000 population), with no Sunday services until 1 p.m., announced for November 14, has been deferred until November 22.

Midland Region.—Similar 9 p.m. curfew arrangements and Sunday modifications were announced for November 15, with the exception of Birmingham, which, on account of its size, is having special consideration; they have, however, been postponed until November 22.

Eastern Region.—Similar 9 p.m. curfew arrangements and Sunday modifications had been announced for November 8, but were deferred until November 16. An added restriction is that all buses must reach their garage by 9.45 p.m. The London Area is excepted. Special services for the Forces run until 10 p.m.

South-Eastern Region.—A curfew at 9 p.m. on all bus and trolleybus services, excepting those of London Transport, will be imposed shortly. On Sundays no services will run before 1 p.m. Special arrangements will be made for essential workers and Civil Defence personnel.



BUT FOR THE BUSES . . .

A great ship glides down the slipway, soon to bring supplies to this island. In the background stand the men who built her, watching for a moment before they turn again to their work—men who must be taken to and from their work at all hours, in all weathers.

But for the buses the tempo of production could never have reached the peaks.

BRITISH BUSES

ISSUED BY THE BRITISH OMNIBUS COMPANIES PUBLIC RELATIONS COMMITTEE

Recent national newspaper advertisement in the "British Buses" series

The arrangements will come into force on the following dates: November 30, Maidstone; December 2, districts served by the East Kent Road Car Co. Ltd. and the Maidstone & District Motor Services Limited; December 3, Brighton, Hove, and Eastbourne; January 4, districts served by the Southdown Motor Services Limited and the Aldershot & District Traction Co. Ltd. The last-named date is substantially later than the others because of the difficulties in re-arranging rural schedules. Already, in Tunbridge Wells there are no services after 9 p.m.

North-Western Region.—The Regional Traffic Commissioner intends to continue his policy of pruning services throughout the region rather than imposing curfew regulations which he feels might lead to local anomalies. He has asked transport undertakings in Lancashire and Cheshire to make a further 10 per cent. reduction in public bus services. Distinctions will continue to be drawn between the needs of individual towns and country localities. The transport position in the region is under daily scrutiny and will be directed according to circumstances as they arise. A general evening time-limit in the North-West is not impossible, but at the moment it is extremely unlikely. Substantial cuts in night services have already been made everywhere. Various towns have made their own curfew arrangements at 9.30 p.m. These include services from Manchester and Salford to Stockport, Bury, Bolton, Oldham, Rochdale, Ashton, and Stalybridge.

Scotland.—In Edinburgh and Glasgow, restricted hours of road transport services came into force on November 1.

Last vehicles leave the city centre at 10.30 p.m. on weekdays and 10 p.m. on Sundays. Bus companies are preparing new timetables to give effect to the restrictions before the beginning of December. From November 22, the curfew will be extended to the S.M.T. group; the last buses will leave Glasgow at 10.30 p.m., but on long-distance routes at 10 p.m. No return tickets will be *issued* at weekends.

Government Road Haulage Scheme

The first stage in carrying out the new road haulage scheme is now nearing completion. Each of the 12 divisions has been sub-divided into areas, which will number altogether 55. The boundaries of these areas, drawn so that they do not in general cross the fuel-rationing districts, have been determined.

Bognor-Horsham Coach Service

One area where it has been necessary to make special local provisions as the result of the withdrawal of long-distance coach services is between Bognor and Horsham. On the old Bognor-Littlehampton-Chichester-Midhurst-London express coach service of the Southdown Motor Services Limited, very large numbers of passengers travelled between Midhurst and London only, and it was the practice of the company to supplement its ordinary bus service number 59 (Chichester-Midhurst) by filling the seats booked for Midhurst passengers with ordinary bus passengers left over from the stage carriage services. The Bognor-London coach service, in common with the other express routes of the Southdown Motor Services Limited operating between London and the South Coast, ran for the last time on September 29. To make good the deficiency, an express motorcoach service between Bognor and Horsham, *via* Chichester, Midhurst, and Petworth, was begun on September 30. It is intended primarily to cater for the longer distance journeys, and the special fare table provides minimum fares of 1s. single, and 1s. 6d. return. All the coaches pick up and set down in the same way as the ordinary bus service. In addition to the minimum fare, the coach fares are slightly higher than those on the bus. Return tickets are interavailable, subject to the payment of the difference between two fares.

Travel To and From Ireland

The railway and steamship companies have given notice that they will not issue rail and steamer tickets for travel to Ireland between December 14 and 26 (both dates inclusive) unless the passenger is in possession of a "sailing" ticket, which must be obtained in advance. "Sailing" tickets will be issued free of charge, and application for them should be made at least 10 days before the date of the proposed journey, and must state not only the proposed date of travel, but also an alternative date. Similar "sailing" tickets will be required for journeys from Ireland between December 28 and January 5 (inclusive). Passengers to Ireland must also be in possession of exit permits.

A.R.P. in Eire

One of the largest A.R.P. exercises ever staged at a railway terminus in Eire took place on October 25, at the Amiens Street Station of the Great Northern Railway. About two thousand employees of the G.N.R. participated. In the goods yard, columns of smoke arose from sheds and stationary wagons, as practice incendiary bombs were ignited. The outbreaks were tackled with stirrup pumps as well as by hoses fed from large hydrants. In addition, the demolition squad rescued men trapped by the debris of a collapsed wall. The exercise included patrol work, message carrying, and administering first aid. It is interesting to note that special provision was made for the arrest of looters.

Poster issued by the Ministry of Supply for display in locomotive manufacturing works. The new "austerity" engine is described at page 492

Irish Air Services

The regular weekday air line between Manchester (Barton) and Dublin which is operated by the West Coast Air Services Limited, in association with Aer Lingus Teoranta, ceased to operate after November 14. It was replaced from Monday, November 16, by an air service operated by the same companies between Liverpool (Speke) and Dublin. It will be recalled that there had been an intention to transfer the terminus in Great Britain from Manchester to Liverpool as from August 10 last, but that the proposal was deferred.

The air line between Dublin and Limerick (Rineanna) operated by Aer Lingus Teoranta was suspended after the journeys on October 30. It was opened on August 12 last (see our August 28 issue, page 209), and was thus in operation for only ten weeks.

American Road-Railers

Goods trains, locomotives, and carriages that can travel on rail or road are now running on fifteen American railways, as well as at a number of U.S.A. Government ordnance plants. The cars run on pneumatic rubber tyres, and steel guide wheels keep them on the rail track. The guide wheels can be retracted at any time, the locked steering gear released, and the vehicle is ready for road service. The flexibility of these "auto-railers" enables them to reach any part of a factory without the need for laying a railway siding. They are already proving their worth by carrying ambulances, fire trucks, and inspection cars, and are conveying explosives from ordnance factories. One of these "auto-railer" trains formed the subject of a brief illustrated article at page 470 last week.

U.S.A.-Central America Rail Link

An all-rail link between the United States and Central America, which will help to alleviate the wartime shortage of steamship facilities in the Caribbean Sea, has now been completed and was due to be opened on November 15. The last link in the land line, which will also provide a trans-shipment service from South American ports, is a bridge over the Suchiate River between Mexico and Guatemala. Although the connection is designed primarily for handling freight, it may prove possible for a satisfactory rail passenger service to be established. Through running is not practicable, for at Ayutla (Guatemala) standard-gauge railways have to transfer their freight to the narrow-gauge systems beyond. A transfer platform between the tracks of different gauge will permit car-to-car transfer. The through service is being established by the Missouri Pacific Railroad, the National Railways of Mexico, and the International Railways of Central America.

Clearance of Cargoes at Union Ports

A statement has been issued by the office of the Minister of Railways & Harbours, Union of South Africa, urging the imperative necessity for importers to do everything in their power to effect the expeditious clearance, dispatch, and removal of cargo from harbour areas. The statement points out that the difficulties with which importers have to contend are appreciated by the South African Railways & Harbours Administration, which has collaborated with the Department of Customs & Excise and the shipping companies to assist importers in the above respect. Facilities have been extended by the Commissioner of Customs & Excise whereby goods arriving in advance of documents may be cleared through the customs. On receipt of manifests, shipping companies advise importers of any cargo manifested for them and, in the case of a vessel arriving without a manifest, the Administration advises importers, where the marks are known, of uncleared cargo on hand. The harbour and customs officials are acting together to facilitate the identification and disposal of all uncleared cargo, and every opportunity is being afforded to importers or their clearing agents to inspect the shed lists of such cargo. Where it is impracticable to clear goods "duty paid" at the ports of entry, importers are advised to avail themselves of the facility of having their consignments removed in bond from the coast to inland customs stations.

The serious state of congestion which for some time prevailed at the ports, due to

The first train, after the British occupation of Madagascar, about to leave Brickaville Station for Tananarive (Antananarivo)

accumulation of uncleared cargo, has been relieved, but it is emphasised that an important responsibility still rests with importers and their agents to clear their goods without delay. It is pointed out that, at the risk of ships and lives, valuable cargoes, some of them irreplaceable, are brought in, and if left for undue periods in harbour areas, usually the first objectives of enemy action, these are exposed unnecessarily to damage. Apart from this fact, their presence does not permit freedom of movement on wharves and in sheds.

Canadian Mobile Workshops

Mobile workshops mounted on medium-sized motor lorries are being built in Canada for the use of the Armed Forces while in the field. Each unit is equipped with a lathe, anvil, drills, welding apparatus, and a rivetting hammer. Steel drawers are provided to hold spare parts, and there are also a tool cabinet and a work bench.

Road Transport in Brazil

It is reported that, since Brazil became one of the United Nations, every private motorcar has been removed from the streets of Rio de Janeiro, and that local transport facilities are limited to tramcars, motorbuses, and taxicabs. Taxis are restricted to short journeys, as their daily quota of petrol is only 10 litres. The tramway company and the bus systems of Rio de Janeiro have made emergency provisions for handling the increased volume of passengers. Bus queues have been formed, but it is said that a passenger seldom need wait longer than 15 minutes. Many of the buses in Rio are equipped with diesel engines. Shortage of fuel supplies may shortly result in reduced operations.

Swiss Transit Traffic through Spain

Some further details have recently come to hand regarding the road transport service across Spanish territory from the Portuguese to the French frontiers organised by the Swiss Autotransit Genossenschaft. Brief details of the undertaking were given in our issues of November 14, 1941 (p. 511), and February 27, 1942 (p. 314). It is a non-profit making concern and the Swiss Federal Government has guaranteed two-thirds of the share capital in the event of loss. The road transport service which it maintains was organised in order to assist Switzerland in securing raw materials and food.

From August 16 to December 31, 1941, Swiss lorries made 255 trips and transported nearly 2,500 metric tons of goods. Recently the operations have been handicapped by fuel shortage, and steps are being taken to maintain the service with substitute fuels.

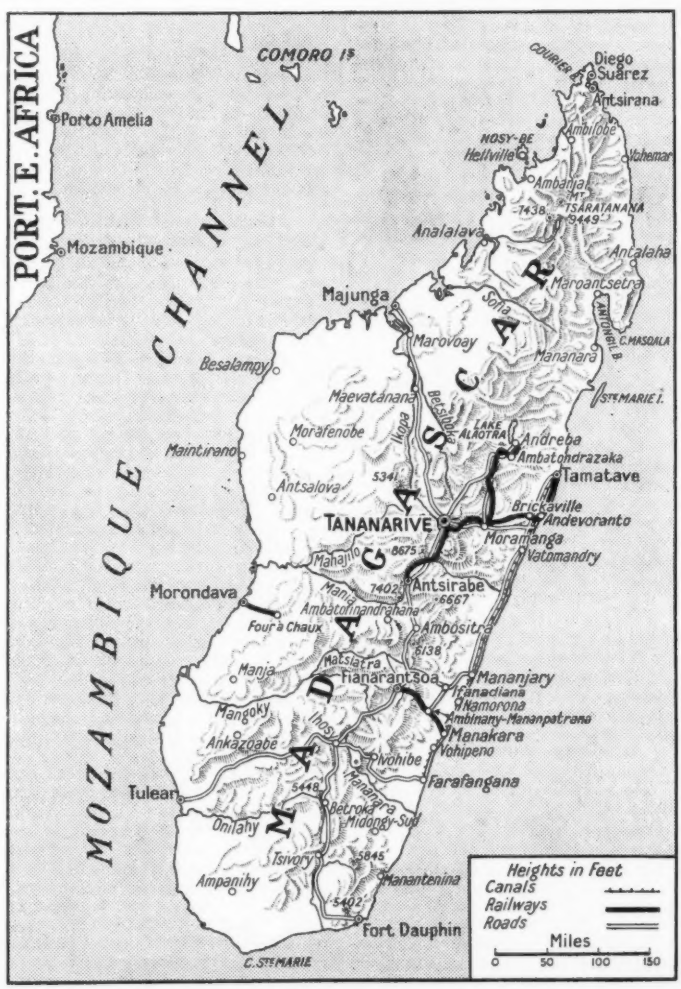
It is reported from Switzerland that the Swiss Government has agreed that the 200 covered railway wagons which are used exclusively for carrying imports from Portugal and Spain to the French frontier, in transit for Switzerland, should be repaired and maintained at Swiss expense in order to assist the Spanish railways.

Spanish Rail Traffic Suspensions

A message from Madrid says that the railway services from Spain to Switzerland and Portugal were suspended on November 12. The services from Spain to France were stated to be running normally, but the Germans have taken over the customs and other frontier arrangements on the French side.

Dining Cars as Lecture Carriages

It is reported that in occupied France the Germans have converted a number of dining cars into lecture coaches, which are used to instruct French train crews in German methods and requirements. These vehicles tour over the lines of the French National Railways and at every halt three German lecturers give film talks.



Sketch map of Madagascar and its railways

War Damage to Public Utility Undertakings

Definition, grouping, and contributions as set out in the Government White Paper

A White Paper (Cmd. 6403) was issued on November 12, from which the following abstracts have been taken. It will be recalled that an outline of proposals for the further legislation needed to provide for payments in respect of war damage to, and contributions from, undertakings covered by Section 40 of the War Damage Act, 1941, was given in a statement by the Chancellor of the Exchequer on May 29, 1941. The consultations then foreshadowed with representatives of public utility undertakings have proved valuable, and though they are not yet complete it is thought that the further discussions which remain to take place before it will be possible to introduce a Bill into Parliament would be assisted by a fuller memorandum analysing the subject in the light of the consultations so far held.

2. The general effect of Section 40 of the principal Act was to except certain types of undertakings from the operation of Part I of the Act pending further legislation. The section applies to statutory public utility undertakings as there defined and certain other undertakings defined in sub-section (4) as follows:—

> "(*b*) except in so far as Parliament may hereafter determine, any undertakings of such a character that the valuation for rating purposes of hereditaments in which the undertaking is carried on is made by reference to the accounts, receipts, profits or output of the undertaking;
>
> (*c*) any other undertaking to which Parliament may hereafter determine that this section shall apply."

Section 40 has itself no reference to the goods of the undertakings in question, but, as was explained in the statement of May 29, 1941, goods of statutory public utility undertakings, were exempted from compulsory insurance under Part II of the Act, and the undertakers were advised to defer voluntary insurance.

3. Section 40 was enacted at a time when not only the nature of the modifications that would be required in the principal Act but also the precise field over which they would have to be applied was known to require further study. All that could be said at that stage was that the undertakings to which the Act could not be applied without modification would probably be found within the general field indicated by Section 40. The conclusion is that the undertakings to which Section 40 applies or may apply fall into three groups:

> (*a*) public utility undertakings for which somewhat far-reaching modifications will be necessary;
>
> (*b*) certain undertakings of the kinds indicated in paragraph 53 below, referred to as "extensive undertakings," for which relatively minor modifications will be required;
>
> (*c*) other undertakings to which the principal Act can be applied without modifications.

4. It is proposed that the new legislation should begin by repealing Section 40 of the principal Act. It would then proceed to provide for precise definition of the undertakings to be dealt with as public utility undertakings and "extensive undertakings" respectively, and make provision for each of these types of undertaking. Undertakings which fall within neither definition would then, with the repeal of Section 40 of the principal Act, automatically become subject to the provisions of Part I, as well as Part II, of that Act from the commencement of the risk period, but arrangements would be made in collecting arrears of instalments to secure that no unreasonable burden was imposed on the contributors.

5. The new legislation will not form a self-contained enactment completely separate from the principal Act, many of the provisions of which will require to be applied or adopted. In particular, provision will be required on the lines of Section 7 of that Act, which deals with the securing of the public interest in the making of payments. This will necessitate close co-operation between the War Damage Commission and the Government Departments concerned with public utility undertakings, especially where the measures proposed for making good the war damage involve substantial changes, for example, a change in the siting of the property.

6. It may be convenient at this point to refer to a problem which is not necessarily peculiar to undertakings falling within the scope of Section 40 of the principal Act, though its most difficult manifestations occur in this field. This is the problem of property which is "land" and in which the person to whom in common parlance the property belongs has in law no proprietary interest, *e.g.*, where a tenant has erected buildings on land held on a tenancy of the site which though nominally short is by custom or understanding between the parties one of indefinite duration. This problem remains under examination.

Definition of Public Utility Undertaking

7. Public utility undertakings were excluded from the principal Act because, for a number of reasons, neither the contribution nor the payment structure of that Act was appropriate to them. The main factors contributing to this situation were their peculiar physical features (in particular the extension over wide areas of fixed distribution networks) and the difficulty of separately valuing their immovable and movable property. Moreover, the distinction between developed and other hereditaments is not applicable to public utility undertakings, and the test applied by Section 4 (1) (*a*) of the principal Act for determining whether a cost of works payment is to be made in respect of a developed hereditament, namely, whether the making good of the damage would require works costing more than the difference between the value of the hereditament when repaired and its value as a site with the damage not made good, is inappropriate to public utility undertakings, which are under an obligation to render service. An alternative test is required of more general application than is afforded by the powers already existing under the principal Act. The degree, however, to which these factors are present and cause difficulty varies considerably between cases; nor is the general solution proposed for the difficulty of separately valuing movable and immovable property, namely, group contributions, equally appropriate and workable over the whole range, especially in the case of small undertakings, such as some of the smaller railway, light railway, canal, inland navigation, dock and harbour undertakings, and probably all quay and pier undertakings. Moreover, there are some services, such as road passenger transport, gas, electricity, and water supply, which are in varying degrees performed by persons not working under statutory powers as well as by statutory bodies. Where the difficulties of applying the principal Act are not present in their highest degree, the question whether undertakings of these types should be treated as public utility undertakings or otherwise, must depend on a balance of considerations. It is thought that tramway and trolley vehicle undertakings other than that of the London Passenger Transport Board can be dealt with under the provisions of the principal Act (under which bus undertakings already fall) with the modifications appropriate to "extensive undertakings."

8. It will be noted that in the case of certain types of undertakings (railway, light railway, canal, inland navigation, dock, and harbour undertakings) it is contemplated that some but not all statutory undertakings of the types in question should be treated as public utility undertakings. It is proposed that the Act should contain power to make orders, after consultation with associations representative of the persons interested, naming individually the undertakings of the types in question which are to be dealt with as public utility undertakings in so far as this cannot be done satisfactorily by any general formula. Undertakings of these types which were not included in any such order would not be public utility undertakings for the purposes of the Act. A similar procedure would be necessary if it were decided to treat any non-statutory water undertakings as public utility undertakings. Undertakings of the types referred to which were not specified as being public utility undertakings would in general fall to be treated as "extensive undertakings."

9. It appears desirable and convenient that activities not themselves of public utility type, but ancillary to and not easily separable from public utility undertakings in conjunction with which they are carried on, should when carried on by the same person as the person who carries on the undertaking to which they are ancillary be treated as part of that undertaking. (Examples, railway hotels, and the carrying businesses of canal undertakers.)

Grouping of Undertakings

10. For the purpose of applying the contribution arrangements proposed, public utility undertakings will have to be divided into groups. On the assumption that tramway and trolley vehicle undertakings (other than that of the London Passenger Transport Board), drainage authorities (including catchment boards), and refuse disposal undertakings are not to be treated as public utility undertakings for the purposes of the Act, it is proposed that there should be nine groups, namely, railway, canal, dock & harbour, lighthouse, gas, electricity, sewerage, sewage disposal, and water, undertakings in Northern Ireland to be included with those in Great Britain in their appropriate groups. It is proposed that the groups should be as follow:—

11. The railway group would consist of (*a*) statutory railway undertakings (including railways in Northern Ireland and the undertaking of the London Passenger Transport Board, but excluding (i) certain railways included in other groups, as, for example, a railway carried on by a dock or harbour undertaking, and (ii) certain railways of which the sole or principal traffic is that of manufacturing or mining companies with whom they are associated) together with (*b*) certain undertakings wholly owned by the main-line railway undertakings, and (*c*) certain statutory

light railways (other than light railways which are of the nature of tramways).

12. The canal group would consist of certain statutory canal and inland navigation undertakings (other than railway-owned canals). Such undertakings vary very widely in size and importance, and it is not considered that all the smaller undertakings could be conveniently included. The precise line of demarcation remains to be considered. Questions of demarcation may also arise in relation to undertakings which partake of the character both of a canal and a dock. It will be also necessary to consider whether certain undertakings with both land drainage and navigation powers would be more appropriately included in the canal group or treated as drainage authorities.

13. The dock & harbour group would consist of certain statutory dock and harbour undertakings (other than railway-owned docks) but probably no quay or pier undertakings. Here again there is wide variation in the size and importance of the undertakings, of which the smaller probably cannot be conveniently included.

14. The lighthouse group would include only the lighthouse (but not the pilotage) undertakings carried on by the Corporation of Trinity House, the Commissioners of Northern Lighthouses and (except in so far as the undertakings serve the Eire Coast) the Commissioners of Irish Lights. Other lighthouses and aids to navigation would be regarded as part of the undertaking to which they belong.

15. The gas group would include, in addition to statutory gas undertakings, any non-statutory gas undertaking carried on by a person whose principal business it is to carry them on.

16. The electricity group would consist only of statutory electricity undertakings.

17. The proposal to have separate groups for sewerage and sewage disposal raises a question of definition which will require further examination.

18. It is proposed that the water group should include hydraulic power undertakings.

19. There are a number of cases in which more than one public utility undertaking is carried on by one undertaker. Here no single principle is universally applicable. Where there is one undertaking which can be regarded as a principal undertaking to which others are ancillary, it appears convenient that public utility undertakings of more than one kind carried on by the same undertaker should be treated as one undertaking and fall into the group appropriate to the principal constituent; in other cases where the undertakings carried on by the same undertaker are coequal and relatively independent it seems preferable that each public utility undertaking should be included in its appropriate functional group. Thus, following the former principle it is proposed that railway-owned docks should be grouped with railways, and that a railway carried on by a dock or harbour undertaking should be grouped with the rest of the latter undertaking. It is in general the intention that the first principle should apply to all undertakings carried on by persons who carry on undertakings in the railway group.

Definition of Public Utility Assets

20. The preceding paragraphs have dealt with the question what undertakings are to be treated as public utility undertakings for the purposes of the proposed legislation. It is next necessary to consider what assets, in which the persons carrying on those undertakings have an interest, are to be brought within the scope of the scheme, as "public utility assets."

21. In the case of immovable property which is "land" within the meaning of the principal Act the first test would be whether the person carrying on a public utility undertaking holds a proprietary interest therein. If he holds such an interest, the "land" would be public utility assets unless specially excluded under the following paragraph. But this in itself would not include all immovable property which will have to be treated as public utility assets, for example, electric cables and pylons, gas and water mains. "Public utility assets" would therefore also comprise any property, whether movable or immovable, which is owned in the course of or is held or used mainly or exclusively for the purpose of the carrying on of a public utility undertaking, with certain exceptions in the case of movable property.

22. It is thought that in the case of immovable property there may be some properties which because of their character or the proportionately small interest of the undertaker in the property, it would be more convenient not to treat as "public utility assets." Possible examples are farms in the catchment areas of water undertakings, and offices occupied by undertakers in large blocks of buildings owned and occupied mainly by other persons. It is proposed therefore that the new Act should confer on the Treasury power, after consultation with bodies representative of the persons interested, to make orders excepting such "land" as may be specified from the definition of "public utility assets."

23. In regard to goods, it is proposed in general not to extend the scope of the scheme beyond that of the principal Act, and therefore that "public utility assets" should not include goods which would be uninsurable under Part II of the principal Act. Special considerations apply, however, to certain goods not insurable under Part II of the principal Act, namely, railway-owned ships (other than requisitioned ships) and gas owned by gas undertakers, which would be treated as "public utility assets."

Payments

24. In general, payments in respect of land which is public utility assets would be on the terms of the special payment provisions for public utility undertakings set out in the following paragraphs. Payments made under these proposals are referred to as "public utility payments." The wide definition of public utility assets proposed will, however, embrace certain property (land) which lacks the intrinsic character rendering special payment provisions necessary. To some of this property, either because of its physical inseparability from specialised public utility property or because of its importance to the operation of the undertaking, the special payment provisions for public utility undertakings will have to be applied. Where, however, these factors are absent, the payment provisions of Part I of the principal Act may be more appropriate (for example, in the case of ordinary residential property owned by a public utility undertakings), and it is proposed that the commission should have the power to apply these provisions to any property which by its nature and situation is more closely related to the generality of properties to which Part I of the principal Act applies than to properties characteristic of public utility undertakings.

25. There would be two kinds of public utility payments applicable to land, namely, payments of outlay and value payments.

26. Payments of outlay would be made, broadly, in all cases in which works approved by the commission after consultation where necessary with appropriate departments were executed to deal with the situation created by war damage to public utility assets. It is proposed that such a payment should be made

(*a*) where a damaged asset is reinstated, either wholly or in part, in the same form in which it existed before it was damaged, without additions or alterations (other than omissions);

(*b*) where it is reconstructed with alterations or additions, or where it is replaced, that is to say, where a thing of the same kind though not the same in form is provided in the same place for a use to which the damaged asset was or could appropriately have been put;

(*c*) where it is superseded, that is to say, where a thing of a different kind or in a different place is provided to perform the function for which the damaged asset was used. The commission would consult appropriate departments in any case in which a question arose whether a thing performed the function for which the damaged asset was used.

27. With regard to the amount of a payment of outlay, the statement of May 20, 1941, drew a distinction between repair, the proper cost of which it was proposed to meet without deduction, and replacement, in connection with which depreciation and obsolescence were to be taken into account. The practical consideration underlying this distinction is that, where the work done would give new for old in a form or to a degree such that a payment equal to the full amount of the cost of the work would not only be sufficient for making good war damage to an asset but would also reimburse the undertaker for a loss of value in the asset due to ordinary depreciation, or obsolescence, or redundancy, full payment of the cost of the work should not be made but should be reduced as may be required to take account of these factors. The proposals outlined in the next two paragraphs for the determination of the amount of a payment of outlay are designed to give effect to this consideration in a manner which will not impose on the commission the obligation of computing depreciation, obsolescence, and redundancy in cases where neither the analogy of the principal Act nor the nature of the property that has suffered damage makes it reasonable to take these factors into account.

28. It is accordingly proposed that the amount of a payment of outlay should be determined as follows:—

(i) Subject to the qualification mentioned in the next paragraph, in cases of partial or total reinstatement of the damaged asset in its pre-damage form the amount of a payment of outlay would be computed on the same principle as that laid down in Section 3 (2) (*a*) of the principal Act in relation to a payment of cost of works.

(ii) Where, however, the work done included alterations or additions or where the asset was replaced or superseded the amount of a payment of outlay would be so much of the proper cost (defined in terms similar to those of the principal Act) of any works as fell within the permissible amount, the permissible amount being defined as whichever was the less of the two following amounts, namely, (*a*) the proper cost of reinstating the damaged asset precisely as it was before it was damaged, (*b*) the proper cost of the com-

plete construction of a new asset in the same form as that of the damaged asset before the occurrence of the damage suitably reduced to take account of such depreciation, obsolescence, and redundancy as existed in the asset immediately before the damage. For the purpose of determining the permissible amount in such cases the commission would have discretion to determine what should be taken as a single asset or "unit," guided by the general principle that it should be the smallest thing which could be practically separated as being the subject of the alterations, additions, or supersession. The manner in which and the matters by reference to which depreciation, obsolescence, and redundancy are to be computed would be prescribed after consultation with bodies representative of public utility undertakers in the various groups.

29. The qualification referred to in (i) of the previous paragraph concerns the possibility that cases may arise where war damage is properly dealt with by reinstatement of the damaged asset in its pre-damage form but is so extensive that the practical consideration mentioned in paragraph 27 would apply. The decision as to what should be regarded as a unit in such cases where no guidance is provided by the extent of alterations or additions is however a matter of some difficulty. It will be for further exploration, in consultation with bodies representative of public utility undertakers, whether the number or importance of these cases is likely to be such as to render it necessary to introduce a correcting factor in regard to them; but it is thought that as regards undertakings whose assets include a fixed distribution network the full cost of reinstatment as provided for in (i) of paragraph 28 would in all cases be appropriate in respect of measures taken as under paragraph 26 (*a*) to make good war damage to the network itself. The expression "fixed distribution network" is to be understood as referring to the systems of wires, pipes, rails, etc., required for the purposes of certain types of undertaking, but the precise definition of the expression remains under consideration.

30. Where it is necessary to acquire an interest in or rights in or over land in connection with any works of which the proper cost would fall to be ascertained under the above proposals, the reasonable cost of that acquisition would be treated as part of the proper cost.

31. A deduction would be made from a payment of outlay in respect of the value of any articles, or of any interest in or right in or over land which (*a*) became available as materials or for other use or for disposal in consequence either of the damage or of such works as those mentioned in paragraph 26 or (*b*) were provided or acquired for executing such works and on the completion of those works were or could be disposed of or used for some other purpose.

32. A public utilities value payment would be made in respect of war damage to an asset when either no works such as mentioned in paragraph 26 or only temporary works were executed. Its amount would be assessed in the same manner as is prescribed in the principal Act, namely, as being the amount of the depreciation in the value of the asset caused by the war damage, with an appropriate deduction for the value of any articles which formed part of the asset and became available as materials in consequence of the war damage.

33. In certain cases temporary works will have been undertaken to deal with the situation created by war damage to public utility assets. It is proposed that the proper cost of such works together with the proper cost of any removals or other works necessary in connection with their abandonment should be payable in addition to what would otherwise be payable by way of payment of outlay or value payment as the case may be. The provisions of paragraphs 30 and 31 would apply to such works as they apply to the works referred to in those paragraphs, and in a case where a value payment was eventually made and where temporary works had increased the residual value on abandonment over the value of the asset as it was immediately after the occurrence of the war damage a deduction would be made of the amount of that increase from the value payment.

34. Special provision may be necessary in cases in which works such as those mentioned in paragraph 26 (*c*), while they meet the needs of the public utility undertaking, involve incidental changes in its physical structure or in the use of land, with a consequence that they fail to make good war damage to a proprietary interest other than that of the public utility undertaker. If, for example, a railway viaduct sustained war damage it might be proper not to rebuild it but to supersede it by a structure on another site. In such a case the war damage to the proprietary interest of a tenant of an arch under the viaduct would not be made good. The problem created by cases of this type is under examination.

35. The above payment provisions apply to immovable property which is land within the meaning of the principal Act as proposed to be amended (see the note on paragraph 21). It has not been found possible to frame satisfactory payment provisions which could be applied equally to land and goods, but it is proposed to provide that such payments shall be made in respect of war damage to goods which are public utility assets as would have been made if when the goods were damaged a policy of insurance issued under the Business Scheme (Part II of the principal Act) or, where appropriate (*e.g.*, gas owned by gas undertakers), under the War Risks Insurance Act 1939, had been in force in respect of those goods. Payments in respect of such goods would form part of the payments in respect of public utility assets by reference to which it is proposed that public utility contributions shall be assessed. As there would thus be no separate premiums in respect of goods the necessity for separate valuations of the goods of public utility undertakings would still be avoided.

36. Payments made under Section 40 (3) (*b*) of the principal Act would be treated as payments on account of any payments due under the new legislation.

Contributions

37. Before dealing with the contributions to be paid by public utility undertakers (referred to in the following paragraphs as "public utility contributions") it will be convenient to refer to a change which it is proposed to make in the provisions of Part I of the principal Act relating to liability for contribution.

38. Section 40 of the principal Act provides that if at the relevant date in any year any contributory property is occupied mainly or exclusively for the purpose of the carrying on of an undertaking to which that Section applies, no instalment of contribution shall be payable for that year in respect of that property.

39. With the repeal of that provision it is proposed to provide that instalments of contribution under the principal Act shall be payable in respect of properties consisting of "public utility assets" only where the property is let to a person who is not a public utility undertaker and the tenant would normally be the direct contributor. The amount of the contributions so paid would be taken into account in assessing the amount of public utility contributions in the manner explained below.

40. The principal effect of this would be that, while all public utility assets at present outside the scope of Part I of the principal Act would remain outside the scope of that Act, the existing liability of public utility undertakers for contribution under Part I of the principal Act in respect of properties which are not occupied for the purpose of their undertakings but in respect of which they are, as the law now stands, direct contributors would be removed. Public utility contributions would be based on the amount of payments in respect of war damage to all public utility assets and would thus in effect cover these properties.

41. It is proposed that contributions should be assessed as follows. In arriving at an aggregate contribution for each group, an estimate would first be made of the total payments in respect of war damage to public utility assets which are assets of undertakings in the group, whether made in respect in land or goods, whether, in the case of land, the payments were public utility payments or payments made under the provisions of the principal Act (see paragraph 24), and whether they were made to the undertakers themselves or to other persons (*e.g.*, tenants of the undertakers). There would then be deducted from one-half of the estimated total payments the aggregate amount of the contributions payable under Part I of the principal Act (see paragraph 39) by tenants of undertakers in the group. The resulting difference would be the aggregate amount to be contributed by all members of the group.

42. It is recognised that where the incidence of damage is high the fraction of one-half mentioned in the previous paragraph may be excessive. It is proposed to provide that at any time before the final instalments of public utility contribution become due the War Damage Commission may take into consideration, either for all groups or for any group or groups, the question whether, having regard to the relative incidence of war damage and other relevant considerations, the fractions should be reduced, and may make a report to the Treasury, stating, if they think that it should be reduced, what lesser fraction it should in their opinion be. This power would become a duty in relation to any group or groups on behalf of whom the Commission were requested by a body representative of persons in that group or those groups to take the matter into consideration. Any report so made to the Treasury would be laid before the House of Commons. Power would be conferred on the Treasury, if such a report were made to them recommending a reduction in the fraction, either in the case of any group or groups or generally, to make an order reducing the fraction in the case of those to whom the recommendation applied to an extent not greater than that recommended; but such an order would require an affirmative resolution of the House of Commons to bring it into effect. No alteration of the fraction in the case of any group would be final until final estimates of payments in respect of war damage to members of the group could be made. Until then the fraction would remain liable to adjustment, either upwards (within the maximum of one-half) or downwards. The procedure proposed above would apply to any such further adjustment.

43. The proportions of the aggregate contribution for which the various undertakers in the group were to be liable would

form the subject of a scheme to be made by a body representative of the group, or when there was more than one such body, by both or all of them. A scheme so made would have effect if approved by the Treasury. If in the case of any group no scheme capable of having effect were so made within a certain time after the commencement of the Act, it would be for the Treasury to make a scheme which would take effect if approved by the House of Commons.

44. It is proposed that public utility contributions should become payable by four interim instalments at yearly intervals and a final instalment. The due dates for the interim instalments would be laid down in the Act. The date or dates at which the final instalment, or any part of it, would be payable would be determined by the Treasury,

45. For the purpose of each interim instalment, the Treasury would certify what the aggregate contribution of each group appeared to them to be. This they would do by reference to estimates based on the information available to date. Undertakers would be required to furnish information from time to time as to the war damage sustained to date and the estimated cost of making it good. Interim instalments of contributions would thus necessarily be related to the amount of war damage sustained up to the time of framing the estimate. The certificate for the final instalment for each group would be based on a final estimate made when it appeared to the Treasury that the relevant amounts had become ascertainable with sufficient accuracy to justify a final estimate. While the full amount of the final instalment would not be known prior to this date power would be taken to require payment at an earlier date by any group of part of the contribution outstanding after the payment of the fourth interim instalment if, on the basis of revised estimates of the relevant amounts made from year to year, it appeared that the amount of contribution for which the group remained liable was sufficiently large to justify such action.

46. The amount of the first interim instalment payable by any undertaker would be his proportion of one-fourth of the aggregate group contribution as certified by the Treasury for the purpose of the first instalment, the amount of the second interim instalment his proportion of one-half of the aggregate group contribution as certified for the purpose of the second instalment, less the amount of the instalment already paid, and so on. With the fourth interim instalment the undertaker would thus have paid the whole of his contribution so far as it could then be estimated, and the amount of the final instalment would be the difference between the sum of the four interim instalments and the full amount of the undertaker's proportion of the aggregate group contribution arrived at as in paragraphs 41-43.

47. Under the above arrangements the liability for contribution would rest on the individual undertaker. A possible alternative, however, where the necessary central organisation exists might be to place the liability for contribution on the central body, with suitable provision for recovery from the individual undertakers in the group by a scheme as under paragraph 43.

48. Adjustment would be made in respect of any contributions paid under Part I of the principal Act the liability for which is removed by the new Act. Similar adjustment would be made for premiums paid under a policy issued under Part II of the principal Act in respect of goods ceasing by virtue of the new Act to be insurable thereunder. Premiums paid in respect of goods insurable under the War Risks Insurance Act, 1939, which become public utility assets would be similarly adjusted.

F.—Indemnities

49. Under the existing law a person other than a public utility undertaker who is a tenant otherwise than under a short tenancy of a public utility undertaker is normally the direct contributor in respect of the property which he holds from the undertaker and is entitled to be indemnified by the undertaker. Such properties would in general continue to be treated as contributory properties under Part I of the principal Act (see paragraph 39 above) and it is not proposed to disturb the existing position in regard to such indemnities.

50. It is recognised that the question of indemnity will arise in cases other than those referred to in the previous paragraph, but the question of providing for indemnities in any class of case depends not only upon the theoretical justification for indemnities, which in particular types of case may be arguable, but also upon the practical possibility of finding a satisfactory basis by reference to which the amount of the indemnity could be determined. Neither of these points is free from difficulty, and the matter is still under consideration.

51. It is proposed that indemnities for which public utility undertakers are or would be liable, and those to which they would be entitled, should be given and received by them individually and that they should not be brought into account in the assessment of the aggregate contribution of the group to which the undertaking in question belongs.

Extensive Undertakings

52. The difficulties of applying the payment structure of the principal Act to undertakings other than those which it is proposed to treat as public utility undertakings are thought as the result of further study to be less serious than was at one time supposed. Paragraph (*b*) of the definition of "land" in Section 95 of the principal Act has given rise to uncertainty, and it is proposed to repeal it. It is considered that it would be possible to apply the payment structure of Part I of the principal Act, possibly with some modification, in such a way as to deal with the fixed distribution networks (see paragraph 29) of such undertakings as non-statutory electricity or water undertakings or the undertakings referred to at (iii) and (iv) of the following paragraph. The status, as land or goods, of apparatus and plant within buildings would be determined on the basis generally applicable, *i.e.*, by reference to the Plant and Machinery (Valuation for Rating) Order, 1927.*

53. As regards the contribution structure of the principal Act, it is now thought, in the light of the further study that has been made, that the principal Act can be applied without modification to all undertakiugs to which Section 40 of the principal Act now applies or may apply and which it is not proposed to treat as public utility undertakings, with the exception of the following "extensive undertakings":—

(i) undertakings of which the functions are similar to those of an undertaking which is a public utility undertaking otherwise than by virtue of being an undertaking ancillary to a principal public utility undertaking* ;

(ii) Mines, quarries, gravel, sand and other underground diggings ;

(iii) Certain undertakings operated under licence given by the Postmaster General and providing the whole or part of their fixed distribution network, such as wireless relay and news undertakings and the telephone undertaking of the Corporation of Kingston-upon-Hull ;

(iv) Tramway and trolley vehicle undertakings (other than that of the London Passenger Transport Board).

54. The modifications required for applying the contribution structure of the principal Act to "extensive undertakings" as defined above include the following :—

(*a*) Provision to secure that there shall be no liability for a double contribution in respect of any property where a Schedule A assessment and a rating valuation overlap.

(*b*) Provision that the person carrying on the undertaking shall be the direct contributor.

The need for (*b*) arises from the fact that, owing to the method of rating "extensive undertakings," a contributory property is likely to be large in extent, and the legal title to the property as a whole may be complex. The machinery of the principal Act for determining the direct contributor, who is normally the person having the sole or lowest proprietary interest in the whole property, might therefore in certain cases be inapplicable.

55. Apart from these changes, which would apply to all "extensive undertakings," representations have been made that, having regard to the special characteristics of the properties in question, the rate of contribution under Part I (that is, in respect of land) should be reduced in favour of the undertakings referred to in sub-paragraph (ii) of paragraph 53. This matter is under consideration.

56. While it is thought that the due dates for instalments of contribution in the case of "extensive undertakings" should be the dates prescribed for instalments of contribution under the principal Act arrangements would be made to spread the collection of instalments already due in such a way as not to impose an unreasonable burden on the undertakings.

57. The question of indemnities in relation to "extensive undertakings" will require further study, in conjunction with the similar problems that arise in the case of public utility undertakings (paragraph 50).

* It should be noted that, while it is considered possible to apply the payment structure of the principal Act, with the modifications indicated, to certain undertakings which have not hitherto been dealt with under the provisions of that Act, it does not follow that in the actual administration of those provisions the Commission would necessarily deal with these undertakings on precisely the lines explained in their published "Practice Notes" which were designed with other classes o fhereditament in mind.

* Thus, "extensive undertakings" would include non-statutory electricity undertakings, but a hotel would not be an "extensive undertaking," although railway hotels are to be public utility undertakings by virtue of being ancillary to railways.

BICYCLE STANDS IN CONCRETE FOR L.N.E.R. STATIONS.—In view of the recent increase in the use of bicycles to and from stations, the L.N.E.R. has decided to erect bicycle stands of modern design at places where extra storage room is needed. Two types have been adopted : one for erection on open ground, and the other for construction against a wall. Both types will be built on the unit principle so that any number of bicycles from twelve upwards can be accommodated ; they will be of prefabricated concrete, and will have roofs of corrugated asbestos sheets. The method of construction adopted will enable stands to be erected quickly, but easily to be dismantled and reassembled elsewhere if required.

Railway and Other Meetings

Buenos Ayres Great Southern Railway Co. Ltd.

The ordinary general meeting of the Buenos Ayres Great Southern Railway Co. Ltd. was held at River Plate House, Finsbury Circus, London, E.C.2, on November 11. Mr. J. M. Eddy, C.B.E., Chairman of the company, presided.

The Secretary, Mr. N. F. E. Grey, read the notice convening the meeting and the auditors' report.

The Chairman, in the statement circulated with the report and accounts, which was taken as read, said that it was disappointing again to show a heavy deficit in the year's results. In spite of the large increase of £894,000 in gross receipts, nearly the whole of this had been absorbed by increases in the cost of fuel and other materials. The problem of obtaining fuel was becoming more and more acute. Supplies of coal and oil had fallen far short of requirements, and the company was now obliged to burn some 80,000 tons of wood a month. Very little wood was available in its zone, and the necessity of transporting it from the north of the Republic greatly added to its cost.

Increase in Rates

The Government had authorised an increase of 5 per cent. in passenger fares and 10 per cent. in goods and livestock tariffs for a period of twelve months from April 3, 1942. At the same time, however, it had ordered the suppression of salary and wage retentions which were being applied under the Presidential Award of 1934. It also insisted that the railways should meet in full the contribution to the pension fund of 8 per cent. on salaries and wages which they were required to make in accordance with the railway employees pension law. The income from the surcharge of 5 per cent. on the tariffs which had been in force since the inception of the law had not for some years been sufficient to meet this.

The railways had been able to obtain a continuation for a further year of the arrangement whereby the companies were able to make remittances for financial services at 16 pesos to the £, but all endeavours to secure a better rate had been unsuccessful. Dr. Leguizamon and his colleagues of the local committee had been untiring in their efforts to obtain sympathetic treatment from the Government in this and other questions, but the political situation had made their task exceptionally hard.

High Level of Efficiency

In spite of the great difficulty of obtaining and shipping supplies of stores, machinery, etc., the physical condition of the railway and its rolling stock had been maintained at a high level of efficiency. Every possible use had been made of material on hand, especially scrap metal, and strict economy had been practised in all departments.

The efficiency of the British-Argentine railway systems was vital to the economic welfare of Argentina. Great Britain was also concerned that the large capital invested should receive the reasonable return to which it was justly entitled, and the directors would strenuously represent that these considerations should receive full weight in future discussions.

Because of continued ill-health and blindness, Dr. Roberto M. Ortiz had resigned the Presidency of the Argentine Republic on June 24 last, and the Vice-President, Dr. Ramon S. Castillo, had automatically assumed the office of President. To the general regret, Dr. Ortiz had died suddenly three weeks later.

Argentina had also lost two other distinguished citizens during recent months; Dr. Marcelo T. de Alvear, a former President and the leader of the Radical Party, and Dr. Julio A. Roca, who, in addition to holding many high offices in his country, had represented Argentina in the negotiations in London in 1933, which had culminated in the convention bearing his name.

Lord Davidson recently had made a short visit to the Argentine. He had discussed the company's affairs in detail with the management and had brought back with him valuable first-hand knowledge of the problems which faced the railways.

Difficulties of the Future

Although receipts since July 1 had shown a slight improvement over last year, fuel costs continued to rise and the future could not be viewed without apprehension. Unfortunately, due to the stagnation in the export of cereals, the acreage under cultivation in the railway zone had decreased by some 25 per cent. On the other hand, the volume of livestock traffic should continue as great as during the past year. Until the problem of the disposal of the grain stocks already accumulated, together with the produce of the current harvest, had been solved—and the Government was giving this matter careful attention—it was impossible to make any forecast of value as to future prospects.

It was interesting, however, to point out that in the first seven months of 1942 the value of the exports from the Argentine showed an increase of no less than 25 per cent. over the previous year; the Argentine favourable trade balance for the period showed an increase of 13 per cent.

There had been evidence of plentiful circulation of money throughout the country, due to the Government policy of subsidising agriculture coupled with high prices of cattle. Local industries had multiplied, and internal trade had therefore been well maintained; this, of course, had helped the railway traffics by replacing the large reduction in the tonnage of imports. How long this condition could continue remained to be seen. Whatever difficulties might present themselves stockholders could be sure that they would be faced by the staff, under the able and untiring leadership of Major Loewenthal, with the same spirit of loyal and efficient service as they had displayed in these recent anxious years.

The report and accounts were adopted.

Buenos Ayres Western Railway Limited

The ordinary general meeting of the Buenos Ayres Western Railway Limited was held at River Plate House, Finsbury Circus, London, E.C.2, on November 11. Mr. J. M. Eddy, C.B.E., Chairman of the company, presided.

The Secretary, Mr. N. F. E. Grey, read the notice convening the meeting and the auditors' report.

The Chairman, in the statement circulated with the report and accounts, which was taken as read, said that last year he had hesitated to express an opinion as to the trend of future traffics due to the unsettled conditions then ruling. It was with satisfaction therefore that he was able to report that the year's results showed improvement over the previous period. Fixed charges had been earned with a small margin and the cash position had so improved that the company had been able to pay a year's interest on the 4 per cent. and 5 per cent. debentures, and was paying a further half-year's interest this month.

Fuel Difficulties

Difficulties in obtaining fuel and the heavy cost of it had been outstanding features in Argentine railway working during the year. The Western Railway, however, had suffered less than others because of its local section being electrified. Many materials such as wheels and axles and boiler tubes had become difficult to obtain either in this country or in the United States. In order to coordinate Argentine railway requirements and to maintain contact with the North-American export departments, Mr. T. Pride, the Stores Superintendent of the B.A. & Pacific Railway, had proceeded to the United States on behalf of the combined railways.

The Government had authorised an increase of 5 per cent. in passenger fares and 10 per cent. in goods and livestock tariffs for a period of 12 months from April 3, 1942. At the same time, however, it ordered the suppression of salary and wage retentions which were being applied under the Presidential Award of 1934. It also insisted that the railways should meet in full the contribution to the pension fund of 8 per cent. on salaries and wages which they were required to make in acordance with the railway employees pension law.

Dr. Roberto M. Ortiz had resigned the Presidency of the Argentine Republic in June last because of ill-health and had died three weeks later. Early in his career Dr. Ortiz had been a member of the legal staff of the railway. Dr. Ramon S. Castillo, the Vice-President, who had been acting for Dr. Ortiz during his illness, had assumed the Presidency on the latter's resignation, in accordance with the constitution.

Argentina had recently lost two other distinguished citizens who had been good friends of this country. Dr. Marcelo T. de Alvear, leader of the Radical Party and President of the Republic from 1922 to 1928 had died on March 23, and within the last month Dr. Julio A. Roca had also passed away. It would be remembered that in 1933 Dr. Roca had headed the mission to London which had negotiated the treaty bearing his name.

The application of the law for the coordination of transport had been virtually ineffective, but road competition had tended to fall off not only through the railway's efforts but due to the shortage of petrol and spare parts which was forcing motor lorry owners to curtail their activities.

Due to the fuel shortage there had been considerable mining activity in the Andine district to the west of the line. A Government project had been under consideration to build a railway extension

running south and west of the company's Colonia Alvear branch to encourage the mineral development of this zone.

Thanks to the Government's efforts to protect the grain grower, internal conditions in the country had suffered relatively little up to the present. The Government was now faced with the financing and disposal of both the balance outstanding from last year's crop and the new crop. The volume of the latter, however, was expected to be below the average, due to a smaller acreage under cultivation and an inclement season. In spite of this, as long as meat shipments to Great Britain continued at the present level and the grain was moved—if only to the ports for storage—the immediate outlook from the point of view of gross receipts was hopeful, but ever rising fuel costs would require increased receipts if stability was to be maintained.

Lord Davidson had recently visited the Argentine where he had had the opportunity of observing at first hand the excellent work being done by Dr. Leguizamon and his colleagues on the local committee and by the General Manager and his loyal and efficient staff.

The report and accounts were adopted.

Staff and Labour Matters

Minimum Payment for Sunday Duty

The Chairman of the Railway Staff National Tribunal has recently given his decision (No. 22) on the following claim by the National Union of Railwaymen, which was referred to him jointly by the union and the railway companies which agreed to accept the decision as final and binding upon them:—

> "That if a man books on duty for three separate turns of duty on a Sunday, payment should be made on the basis of a minimum of eight hours at the Sunday rate for the first two turns and the appropriate minimum rate for a single booking for the third turn, in accordance with the provisions of Railway Staff National Tribunal Decision No. 6."

The issue between the parties is, what are the minimum payments proper to be made to a man required to book on duty for three turns of duty on Sunday and illustrative of the issue raised is the case of a signalman who on February 25, 1940, worked the following turns of Sunday duty:—

9 a.m. to 10 a.m.
4.30 p.m. to 6 p.m.
8.30 p.m. to 9.30 p.m.

For the duties above specified the signalman in question was paid as for a minimum of 8 hours at Sunday rate for the three turns of duty.

It was contended by the union that as a man who works two turns of duty on a Sunday qualifies for 8 hours' pay at Sunday rate in accordance with Decision No. 6 of the Railway Staff National Tribunal, dated October 18, 1939, he should, if called on to work a further turn on the same day, be treated separately for the purpose of payment for the third turn and be dealt with in acordance with Decision No. 6; that before Decision No. 6 the method of payment for Sunday turns was governed by Clause 61 (II) of Decision No. 12 of the National Wages Board, dated December 18, 1923, which provided, *inter alia*, that "a man who books on three times for turns of duty on Sunday shall be paid a day's pay at the ordinary rate plus half time at ordinary rate for the actual hours worked"; that in Decision No. 6 the Railway Staff National Tribunal obviously decided to improve the conditions and rates of pay for Sunday duty; that payment by the companies on the basis indicated in the claim perpetuates part of the terms of the arrangements which were cancelled by Decision No. 6.

It was contended on behalf of the companies that it was the intention of the Railway Staff National Tribunal in Decision No. 6 to restore the provisions contained in the national agreement; that the national provisions did not specifically provide for the case of a man booking on more than twice on a Sunday; that the provision in Decision No. 12 of the National Wages Board which relates to payment for three turns of duty on a Sunday has not been altered by Decision No. 6 of the tribunal; that it was not the intention of the tribunal in Decision No. 6 to improve the original conditions in regard to payment for Sunday duty; that the payments resulting from the claim would in many instances be anomalous or excessive.

The Chairman found against the claim of the N.U.R.

Indian Railways and the War

From time to time, a few details have been given in our columns of the war work that is being carried out by Indian Railways, but they have related to isolated items of news. During the war it is not permissible to reveal enough information to enable a comprehensive view to be taken of the remarkable series of war achievements, but the following further notes, in amplification of those previously published, give some idea of the magnitude of the tasks successfully tackled. Railways in India have played a progressively important part in the production of munitions and war materials generally, and have met military needs to the greatest possible extent. It is remarkable how smoothly their workshops have been able to adapt themselves from a peacetime basis of production to war production.

Before the war these shops were the main potential for munitions production, apart from the ordnance factories, and three of them are now fully engaged exclusively on this work. In addition to their own railway work, the others are working to capacity upon war production. Over 16,000 men are engaged on munitions and many more thousands are under training for similar work or in railway military units.

Remarkable Workshop Achievements

One workshop has been specially laid out for the manufacture of shells and components for fuses, and the making of tools, gauges, fixtures, etc., is also specially catered for. Never before have such jobs as the machining of ordnance materials been attempted outside the ordnance factories, but in carrying out this work satisfactorily the railway workshops have set up a new and creditable record.

In one workshop alone, well over 1,000 motor lorry bodies have been turned out, 100,000 steel sleepers have been converted to standard gauge, and a vast volume of smaller work has been done. In two successive years 10,000 and 15,000 ammunition boxes were completed, over a quarter of a million grenade bodies were cast and machined, and in one year 75,000 shells were machined and bottled; in addition, jigs, tools, and fixtures for machining 123,000 fuse body stampings were undertaken, all in the one workshop. Other workshops have been responsible for almost equal achievements.

In point of training, railway shops are also prominent. In one of these training centres well over 800 fitters, turners, machinists, blacksmiths, copper and tinsmiths, electricians, and electro-platers are under training; it is the largest centre in India. Intensive individual training is given to all trainees to enable them to become proficient in the minimum of time, usually about four months. The use of ferrous and non-ferrous metals, calculations required for the change-gears of lathes, and other information about the various trades are taught. Special instructors were recruited from the United Kingdom to raise the standard of training and bring it into line with modern British practice. The work turned out is, therefore, of a high standard, and even third grade trained turners are able to work to precision limits.

Engineering Departments have carried out many special works for the Indian Defence Department, such as the construction of military bases served by numerous sidings. At one such base no fewer than 35 miles of track had to be laid over a wide area in hilly country. In another instance a reserve base was established at an existing large junction, involving the laying of 13 miles of track; the whole job including earthwork in the embankment, buildings, bridges, and water supply, was completed in 2½ months. In both cases and also in others, remodelling of existing stations and signalling and main-line connections were necessary.

Some 19 existing branch lines, involving the lifting of 770 miles of track, were taken up during the two fiscal years 1940-41-42. In addition, 800 miles of permanent way have been made available for military lines from stock and from relaying. Bridge girders, signalling equipment, and tools in large quantities have also been sent overseas.

Activities of Bridge Departments

Railway Bridge Departments have been very busy in other directions. Their workshops have fabricated very large tonnages of steelwork for many military purposes unconnected with railways. For instance, one shop turned out 170 steel hutting garages for the Defence Department, by mass production methods, at the rate of a hut a day, using over 3,000 tons of steel; 100 open steel sheds involving 1,000 tons of steel were also produced, as well as two large steel-framed workshops. Utilising all available fabricated steel not in use in the country generally, roofing and columns for a shell factory and munitions tool shops have been built. Some 15,000 tons of steel bars for concrete reinforcement were also bent to correct shapes in a bridge workshop.

The withdrawal of engines and rolling stock has been spread throughout the subcontinent to distribute any effects that might result from shortage of stock. Large quantities of metre-gauge locomotives and of both broad-gauge and metre-gauge carriages and wagons have been supplied for service overseas. The locomotives were all overhauled and converted to oil-burning prior to shipment, and all broad-gauge stock had to be converted

to standard gauge—no mean work. Wagons were withdrawn from all railways in proportion to their stocks, and, by reason of shortage of shipping space, most of them had to be dismantled, marked, and packed for shipment. This work was, however, centralised at three workshops of wagon-building firms.

The Defence Services Exhibition Train and its 15,000-mile tour over the greater part of the Peninsula have already been described in these pages. The entire train of 23 vehicles was stripped, converted, and painted in three weeks in Lahore shops, N.W.R. More than 8,000,000 people visited it in the course of the tour.

Transportation Achievements

To give some idea of what the Indian Railways are doing in the way of transportation, it may be noted that in the first two years of the war—when troop movements were comparatively small—one railway ran all but 2,000 special trains for the Defence Department, and carried nearly 800 consignments of ammunition. In addition, some 23,000 vehicles—in terms of four-wheel units—were attached to ordinary trains on military account. On another line 1,025 military special trains were run between April and October, 1941. On a third line 1,545 wagon loads of arms and ammunition were carried in 18 months.

At one period recently the three railways in Calcutta handled the voluntary evacuation of some 500,000 persons from that area, though their maximum capacity was not utilised, as this would have dislocated goods services. Despite some panic among the passengers, the railway staffs carried on under difficult conditions. There was also an exodus from Bombay, in the course of which 15,000 persons left Victoria terminus in a single day last March.

Material and Generous Assistance

From all their departments the railways have supplied men for the Military Railway Companies, for both engineering and transportation duties, to a total of 20,000 men. Railway staffs throughout the country have responded spontaneously and generously in men and money to the call of national service. From one railway alone 27 officers and 2,358 men were released for military service, and 16,366 were engaged solely upon munitions production. Up to February last some 244 officers had been released for service in the Defence and Supply Departments from all railways.

The flow of money from various railway staffs for Defence Loans, fighter aircraft, and ambulances has been remarkable. One railway collected Rs. 2,12,600 for investment in war savings schemes and Rs. 1,49,170 for the War Fund. Another line's staff contributed nearly Rs. 1 lakh to war funds investments, donated Rs. 21,000 to the Viceroy's War Fund, and contributed Rs. 1,68,000 to purchase two aircraft. Yet another railway staff contributed Rs. 3,57,428 for fighter aircraft, Rs. 26,663 to ambulance and Red Cross funds, and Rs. 2,90,000 for investment in war funds. Meanwhile these staffs, seriously depleted as stated above, have been responsible for the heaviest known widespread goods and passenger movements, despite the fact that rolling stock had been reduced to a bare minimum during the lean years of depression and had not subsequently been increased to provide an adequate reserve such as this war would normally demand. Improved methods of operation and a slight reduction in civilian services have made this feat possible.

Questions in Parliament

Petrol for Propaganda Vans

Professor A. V. Hill (Cambridge University—C.) on November 10 asked the Parliamentary Secretary to the Ministry of War Transport whether petrol continued to be allowed to anti-vivisection societies for use in vans employed mainly for propaganda against the methods of preventive medicine advocated by the Ministry of Health and the medical services of the forces.

Mr. P. J. Noel-Baker wrote in reply: I am making enquiries of all my Regional Officers, but so far I have been unable to trace that any issues of fuel have been made to Anti-Vivisection Societies for the purposes mentioned.

Buses and Trailers

Colonel W. H. Carver (Howdenshire—C.) on November 10 asked the Parliamentary Secretary to the Ministry of War Transport whether there was any objection or hindrance to attaching trailers to buses where road surface rendered this possible.

Mr. P. J. Noel-Baker stated in a written answer: The attachment of trailers to buses except for the purpose of gas-producer traction is prohibited by the Public Service Vehicle (Equipment & Use) Regulations, 1941, and in view of the difficulty of manœuvring such a combination and the conditions under which bus services operate, I do not think it would be wise to adopt the course suggested by Colonel Carver.

Bradford Corporation Trams

Captain W. F. Strickland (Coventry—C.) on November 10 asked the Parliamentary Secretary to the Ministry of War Transport, whether his attention had been drawn to the proposal of the Bradford Corporation Transport Department, to replace trams by buses on the Stanningley and Wibsey routes because of the difficulty of securing necessary track-repair materials; and whether he would take steps to supply such materials and thus effect economy in the use of rubber and imported fuel whilst helping to maintain existing motor-transport services in places where tramcars do not operate.

Mr. P. J. Noel-Baker wrote in reply: The outer half of the Stanningley route is in such a bad state of repair that it would have required large amounts of labour and materials to reconstruct it. For this reason, the Bradford Corporation decided to abandon it, and I am satisfied that the decision was right. The corporation inform me that it is not proposing to abandon the Wibsey tram route.

Cheap Travel

Mr. Robert Morgan (Stourbridge—C.) on November 10 asked the Parliamentary Secretary to the Ministry of War Transport, what steps would be taken to preserve cheap travel for part-time students whose advanced technical education necessitated journeys during 40 weeks of the year and costing £10 a year or more.

Mr. P. J. Noel-Baker (Joint Parliamentary Secretary to the Ministry of War Transport): The withdrawal of cheap-day tickets was a necessary measure which the Minister of War Transport adopted with regret. Various reduced rates for railway travel are still available for part-time students, including season tickets. Season tickets are issued at half-rates to persons under 18 years of age who earn not more than 25s. a week.

Mr. D. Frankel (Mile End—Lab.) on November 10 asked the Parliamentary Secretary to the Ministry of War Transport whether he would reconsider the withdrawal of the 1s. day tickets and the system of return fares in the London area in view of the hardship which was being caused to many working people who travelled not for pleasure but to earn their livelihood.

Mr. P. Noel-Baker, in a written reply, stated: The shilling all-day tickets on trams and trolley buses and the cheap-day return tickets on railways have been withdrawn to reduce unnecessary travel. These tickets were issued only after 10 a.m. They were originally introduced as concessions designed to encourage travel during off-peak periods. I am aware that their withdrawal may in some cases increase the cost of necessary travel. I regret that this is so; but as I am sure Mr. Frankel will understand, to make exceptions would create unmanageable problems.

British and Irish Railway Stocks and Shares

Stocks	Highest 1941	Lowest 1941	Prices Nov. 13, 1942	Prices Rise/Fall
G.W.R.				
Cons. Ord.	43¾	30¾	55½	– ½
5% Con. Pref. ...	109½	83½	113	–
5% Red. Pref. (1950)	105¾	96½	107	–
5% Rt. Charge ...	129½	116	128½	+ ½
5% Cons. Guar ...	128	110½	126	+ ½
4% Deb.	113½	102½	114	–
4½% Deb.	115	105⅞	114½	+ 1
4½% Deb.	121½	112	118½	+ 1
5% Deb.	132	122	129½	–
2½ Deb.	70	62⅜	75½	–
L.M.S.R.				
Ord.	17½	11	25½	– ½
4% Pref. (1923) ...	53	33½	62½	+ ½
4% Pref.	68½	48½	75⅝	–
5% Red. Pref. (1955)	97⅜	77	101½	–
4% Guar.	100	85¾	101½	–
4% Deb.	105¾	97	107	–
5% Red. Deb. (1952)	110½	106½	108½	–
L.N.E.R.				
5% Pref. Ord. ...	3¾	2⅜	7½	– 1
Def. Ord. ...	2	1¼	4¼	–
4% First Pref. ...	52½	33	60½	– ½
4% Second Pref. ...	19⅜	10	29½	– ½
5% Red. Pref. (1955)	79½	52	95	+ 1½
4% First Guar. ...	90½	74½	96	+ ½
4% Second Guar. ...	80½	59	88	–
3% Deb.	79½	68¾	83	+ ½
4% Deb.	104	91½	106	–
5% Red. Deb. (1947)	106	102½	103½	–
4½% Sinking Fund Red. Deb.	103½	99⅛	104½	–
SOUTHERN				
Pref. Ord.	65½	43½	75	–
Def. Ord.	15⅜	9	21½	+ ½
5% Pref.	107	77½	110	–
5% Red. Pref. (1964)	107	89½	108½	–
5% Guar. Pref. ...	128	111	126½	+ 1
5% Red. Guar. Pref. (1957)	114¾	107½	112½	–
4% Deb.	112	102½	112½	+ ½
5% Deb.	130½	119	—	–
4% Red. Deb. (1962–67)	108½	102	109½	+ ½
4% Red. Deb. (1970–80)	108¾	102½	109½	+ 1
FORTH BRIDGE				
4% Deb.	99¾	90½	107	–
4% Guar.	99	85½	103½	–
L.P.T.B.				
4½% "A"	120⅜	109½	117½	–
5% "A"	130½	115½	128½	+ 1
4½% "T.F.A." ...	103½	99½	101	–
5% "B"	117	102	117½	–
"C"	46¾	28¾	55	–
MERSEY				
Ord.	24¾	19½	25½	–
3% Perp. Pref. ...	58	51½	59	–
4% Perp. Deb. ...	100	90	100	–
3% Perp. Deb. ...	73½	63	78	–
IRELAND BELFAST & C.D.				
Ord.	4	4	9	–
G. NORTHERN				
Ord.	14½	3	26½	– 2½
G. SOUTHERN				
Ord.	14½	5	23	–
Pref.	17	10	27½	– ½
Guar.	44	16	48½	– 3
Deb.	61	42	70	–

Notes and News

B.E.T. Omnibus Services. — The nominal capital of B.E.T. Omnibus Services Limited has been increased by the addition of £2,099,900 beyond the original registered capital of £100.

Eastern Bengal Railway Annuities.—In accordance with the provisions of Act 47 & 48 Vic. cap. cciv, it is notified that on September 30, 1942, a total sum of £981,773 was invested for the purpose of providing a sinking fund in respect of Eastern Bengal Railway Annuities, Class "B."

Permanent Way Institution.—A meeting of the Manchester & Liverpool Section will be held at the District Goods Manager's Office, Bolton, on November 21, at 3 p.m., when, after the conclusion of other business, a lantern lecture entitled "How We Tried to Get Through" will be given by Mr. E. G. Garstang, District Goods Manager, Manchester, L.M.S.R.

The Fougasse Painting Book.—With the sale of the last copy of the Fougasse Painting Book, issued by Thomas Tilling Limited, and containing extracts from the Tilling Group Road Safety Campaign, based on the inimitable drawings of Fougasse, the full amount realised in support of the Merchant Navy Comforts Fund and the Honourable Company of Master Mariners proved to be £1,921 6s. 10d. This sum has been divided equally between the two organisations, which have thus benefited by this effort of Tilling's to the extent of nearly £1,000 each.

The Paris Metro.—The extension of the Paris Underground Railway system between the stations of Charente and Charent Ecole, which was begun in 1939, is stated to have been opened for traffic in October. According to a recent Vichy broadcast, escalators at stations on the Metro have been stopped in order to economise in the use of electricity. Most of the Metro stations are immediately below the surface and the platforms are approached by short staircases. Only a few stations, in such places as where the Metro passes under the River Seine, and is therefore at a deeper level, are equipped with escalators.

Railway-Associated Air Lines.—The G.W.R., L.M.S.R., and Southern Railway Companies have recently been offered the major interest in British & Foreign Aviation Limited and have acquired these shares. As a result, all the shares in Great Western & Southern Air Lines Limited, West Coast Airways (Holdings) Limited, and Isle of Man Air Services Limited, will now be controlled by the railway companies and the cross-channel shipping companies operating in the same area, thus facilitating the maximum co-ordination between air and surface travel. The boards of the companies affected have been reconstituted. Captain G. P. Olley retains his association with the group and continues as Managing Director of Olley Air Service Limited, one of the companies concerned.

Welded Frames for Rail Units.—The half-yearly January-June issue of *The Welder*, contains among other interesting items, an article entitled "Welded Frames on Rail Units," by Mr. G. W. McArd, who is also a contributor to THE RAILWAY GAZETTE. The author refers to a small shunting engine built some years ago by a leading firm of locomotive builders in which the plate frame was entirely welded, when experiments were being conducted with a view to discovering the extent to which welding might be carried. This experiment did not prove an unqualified success but afforded distinctly useful experience. The article is illustrated by drawings of a mobile power house built for the San Paulo Railway in Brazil for permanent attachment to a set of luxury coaches. Welding was freely employed in the construction of these units.

Central Argentine Railway Moratorium.—The Central Argentine Railway Limited has called meetings, to be held at Winchester House, E.C., on December 3, beginning at 12.30 p.m., of holders of the 4 per cent. debenture stock, of the 5 per cent. redeemable debenture stock 1967/87, of the 5½ per cent. (bearer) notes, and of the interest certificates, in order to consider, and, if thought fit, pass a resolution to extend for one year to December 31, 1943, the moratorium sanctioned by the scheme of arrangement of November 21, 1940.

Moldava Power Station, Roumania.—It is stated that the new Moldava hydro-electric power station is to be erected in the valley of the Upper Bistritza River, which falls into the River Siret to the south of Bacau, in Moldava Province (Eastern Carpathians); the feeder canal for the power station, as well as the latter, will be built underground. The output, it is stated, will be between 400,000,000 and 600,000,000 kWh a year and thus will be equal approximately to the combined production of all existing Roumanian power stations.

Machinery, Plant & Appliances (Control) Orders.—To correct any misunderstanding as to the necessity for licences for repair parts, the Board of Trade draws the attention of all users of machinery, plant, and appliances controlled by the Orders to the fact that repair parts can be supplied without licence only if they are required for the immediate and essential repair of machinery, plant, or appliances which are in current use. If an owner wishes to acquire parts for machinery, which, because of concentration, or for other reasons, is not in current use, he must obtain a licence before accepting the parts. Failure to do so is an offence under the Orders.

Argentine North Eastern Railway Co. Ltd.—For the year to June 30, 1942, gross receipts were £858,760, against £675,451, and working expenses rose from £569,443 to £639,863, leaving net receipts of £218,897 (£106,008). Exchange losses rose from £34,123 to £65,384, and the total income amounted to £153,691 (£73,748). This covers miscellaneous charges and interest for the year on the 5½ per cent. prior lien debenture stock and on the 5 per cent. "A" debenture stock and debentures, but not interest and arrears on the 5 per cent. "B" debenture stock and debentures, payment of which is deferred under the moratorium scheme. Gross receipts constituted a record, but the greater tonnage handled and the high cost of fuel and materials increased the working expenses. The operating ratio, however, improved from 84·31 per cent. to 74·51 per cent.

Peruvian Corporation Limited.—Currency gross receipts of the railways and steamers for the year ended June 30, 1942, constituted a record and exceeded the previous highest total in 1927-28. Net receipts in sterling were, however, considerably lower than in 1927-28, because of depreciation in Peruvian currency. Gross receipts in sterling for 1941-42 were £938,936, against £798,757 in 1940-41, and net receipts were £213,252, compared with £151,841. Earnings for the year amounted to £199,016, and a total of £197,913 was available for debenture service. Of this total a sum of £78,938 was applied on April 1, 1942, in payment of 2 per cent. actual (representing balance coupon No. 93) for the six months' interest due October 1, 1936, on the 6 per cent. first mortgage debentures. A further payment was made on November 2 of 3 per cent. actual in payment of coupon No. 94 due April 1, 1937.

Institution of Mechanical Engineers.—A general meeting of the institute will be held today (November 20) at 5.30 p.m. at Storey's Gate, Westminster, S.W.1, when papers on "Caustic Embrittlement," by Mr. E. W. Colbeck, M.A., Mr. S. H. Smith, B.Sc., and Mr. L. Powell, B.Sc., and on "Corrosion of Boiler Tubes," by Mr. T. Henry Turner, M.Sc., will be given.

Plymouth Transport Joint Committee.—Sir Alfred Robinson, the South-Western Regional Transport Commissioner, held an inquiry at Plymouth on November 12 and 13 into complaints made about changes in local bus facilities as a result of the recent co-ordination scheme between Plymouth Corporation and the Western National Omnibus Co. Ltd. Plympton St. Mary Rural District Council had intimated in a communication to the Regional Commissioner that the changes resulting from the co-ordination have tended to cause increased empty mileage to be run. The result of the inquiry will be announced later.

Institute of Export Meeting.—At a meeting of the institute in London on November 12, Mr. T. W. Fairhurst, who has spent 25 years selling British engineering products overseas, said that there was room for improvement in the carrying-out of the export trade of the country. Britain no longer could claim any particular monopoly, and we should have to go about our export business, which hitherto had been too casual and spasmodic, more smartly and cleverly. He asked for the right kind of Government sponsorship, administration, and advice, and urged that, in trading days to come, men should be put behind the export drive who had learned by experience, and that executives going overseas should have the highest technical and commercial qualifications, first class basic education, exemplary personal manners, and should speak the language of the country.

G.W.R. Accident near Didcot.—We regret to record that at 1.45 a.m. on November 13 a collision occurred at Appleford Crossing, about 2 miles from Didcot, between a freight train *en route* from Swindon to Bordesley and the 12 midnight Paddington to Birkenhead passenger train. The fireman of the freight train engine was killed and the driver, who was seriously injured, subsequently died in hospital. On the passenger train a G.W.R. travelling porter was killed and 14 passengers injured, 10 of whom were detained in hospital. The facts are that the freight train was approaching Appleford Crossing from the direction of Didcot on a loop line which joins the main line a short distance ahead when for some reason not yet determined it passed the signal, and the engine and a number of the leading wagons were thrown off at the catch points. Some of the derailed wagons struck the fourth vehicle, a van containing mail bags, of the Paddington-Birkenhead passenger train which was just passing the spot. This impact caused the derailment of six passenger coaches. Assistance was forthcoming promptly and the injured, after treatment, were removed to the Radcliffe Infirmary, Oxford, or the Warren Hospital, Abingdon. Both main lines were blocked until the afternoon of November 14, but every effort was made to minimise delays by the use of alternative routes.

Railway Stock Market

Activity in most sections of the Stock Exchange has been on a reduced scale, and at the time of writing profit-taking sales have led to a reactionary trend in values. Although the latter was fairly widely spread, the reaction has been moderate when compared with the extent of the gains shown in recent months. In fact, the general undertone of markets remained fairly steady. The less active conditions were attributed mainly to the widespread tendency to await progress of the important war developments in North Africa. Sentiment was assisted by the fact that the recent strong advance in market values has not been followed by heavy liquidation, because this appears to indicate that there was no unhealthy speculative movement developing in the stock and share markets.

As far as home rail stocks were concerned, it would seem that by far the greater part of the much increased demand recently in evidence was on the part of investors prepared to consider the junior, as well as the senior, stocks as permanent investments. It is generally realised that dividend payments on home railway securities can be considered as being, in effect, guaranteed by the Government, and that this position is likely to continue in the post-war period until agreement is reached on peacetime transport problems. It is true that compared with a week ago the junior stocks are lower, but declines on balance do not exceed more than a point. Moreover, senior stocks held recent gains and were inclined to show further improvement; sentiment has been aided by the firm trend in gilt-edged and front-rank investments generally. It is doubtful if there is any other range of securities offering similar attractions to all types of investors; the dividend position is clearly indicated by the terms of the financial agreement, and there is now general confidence that stockholders will receive equitable treatment in any post-war plans, bearing in mind all factors and that home railway securities are, of course, very widely held by all classes.

The prevailing view that over a period the junior stocks appear to offer favourable scope for further appreciation is based on the fact that yields are still attractive and out of line with those on other groups of equity securities. Moreover, whereas the rise recently shown in some of the latter was based on vague, and in some cases, optimistic, suggestions as to the position that may exist for individual trades after the war, the rise in home rails turned mainly on the solid ground of yield considerations. In some quarters it has been suggested that there are possibilities of slightly better dividends on L.N.E.R. second preference and L.M.S.R. ordinary, but this had little influence on the rise in values, it being realised that, even on last year's payments, the return remains attractive at the current level of prices.

Home railway stocks have reflected the firmer trend of markets which appears to be developing at the time of writing, but earlier small reactions have not been fully regained. Great Western at 55¾, compared with 56¾ a week ago, but at 126 and 112½ respectively, the guaranteed and preference stocks held virtually all their recent improvement. L.M.S.R. ordinary moved back on balance from 26¼ to 25¼; the 1923 preference at 62⅞ was fractionally better. L.N.E.R. first preference was 60½, compared with 61½ a week ago, and the second preference 29½, compared with 30¼. Southern preferred went back from 75¼ to 74½ and the deferred from 22⅛ to 21⅛. London Transport "C" was well maintained at 55½.

Argentine rails remained under the influence of the view that there may be little prospect of improvement in results during the war. Nevertheless, B.A. Gt. Southern preference stocks rallied, as did B.A. Western debentures. Elsewhere, United of Havana debentures were 33½. Canadian Pacifics were inclined to improve. French railway sterling bonds reacted, following the recent marking up of prices.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open 1941–42	Week Ending	Traffic for Week: Total this year	Traffic for Week: Inc. or Dec. compared with 1941	No. of Weeks	Aggregate Traffics to date: Totals: This Year	Aggregate Traffics to date: Totals: Last Year	Aggregate Traffics to date: Increase or Decrease	Shares or Stock	Prices: Highest 1941	Prices: Lowest 1941	Prices: Nov. 13, 1942	Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	8.11.42	19,370	— 1,640	45	958,190	869,240	+ 88,950	Ord. Stk.	10⅝	3¼	11½	Nil
	Argentine North Eastern ...	753	7.11.42	15,048	+ 3,846	19	257,190	227,016	+ 30,174	,,	6½	½	6	Nil
	Bolivar	174	Oct., 1942	6,430	+ 2,780	—	47,139	38,504	+ 8,635	6 p.c. Deb.	5	5	18½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	8	2½	18½	Nil
	Buenos Ayres & Pacific ...	2,807	7.11.42	91,200	+ 10,800	19	1,621,140	1,459,200	+ 161,940	Ord. Stk.	7⅛	1½	6	Nil
	Buenos Ayres Great Southern	5,080	7.11.42	152,700	+ 22,890	19	2,539,440	2,399,100	+ 140,340	Ord. Stk.	10½	3½	9½	Nil
	Buenos Ayres Western ...	1,930	7.11.42	52,380	+ 3,120	19	941,880	935,880	+ 6,000	,,	9	2½	11	Nil
	Central Argentine	3,700	7.11.42	123,660	+ 17,175	20	2,303,511	2,092,602	+ 210,909	,,	8½	2⅛	6½	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	9½	⅛	4	Nil
	Cent. Uruguay of M. Video...	972	7.11.42	23,824	+ 1,572	19	401,383	424,805	— 23,422	Ord. Stk.	9½	1	5½	Nil
	Costa Rica	262	Sept., 1942	11,556	— 9,881	9	38,244	68,996	— 30,752	Stk.	15½	11½	15	Nil
	Dorada	70	Oct., 1942	19,470	+ 9,250	44	157,175	122,970	+ 34,205	1 Mt. Db.	97	97	88½	6‡
	Entre Rios	808	7.11.42	19,788	+ 4,050	19	346,122	329,964	+ 16,158	Ord. Stk.	4	1	7	Nil
	Great Western of Brazil ...	1,030	31.10.42	18,500	+ 3,800	44	472,100	414,300	+ 57,800	Ord. Sh.	11/-	1/-	28/	Nil
	International of Cl. Amer. ...	794	Sept., 1942	$324,553	— $42,878	37	$4,633,303	$4,257,101	+ $376,202	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	1st Pref.	⅛	6d.	2	Nil
	La Guaira & Caracas... ...	22¾	Oct., 1942	8,570	+ 1,125	44	71,925	65,445	+ 6,480	5 p.c. Deb.	—	—	80/-	6½
	Leopoldina	1,918	31.10.42	36,580	+ 6,743	44	1,333,541	1,158,264	+ 175,277	Ord. Stk.	4	½	5½	Nil
	Mexican	483	7.11.42	ps. 283,500	+ ps. 6,600	19	ps. 5,277,000	ps. 5,609,400	— ps. 332,400	,,	⅛	⅛	⅛	Nil
	Midland of Uruguay	319	Aug., 1942	10,196	— 2,774	9	22,810	27,480	— 4,670	—	—	—	—	—
	Nitrate	382	31.10.42	13,139	+ 5,325	28	164,010	122,844	+ 41,166	Ord. Sh.	66/-	1½	73/6	3½
	Paraguay Central	274	6.11.42	$3,360,000	+ $301,000	19	$69,869,000	$63,537,000	+ $6,332,000	Pr. Li. Stk.	43	29	51½	11‡
	Peruvian Corporation ...	1,059	Oct., 1942	85,746	+ 12,153	18	336,988	292,346	+ 44,642	Pref.	6½	1⅛	14½	Nil
	Salvador	100	Sept., 1942	c 55,000	+ c 10,000	14	c 183,000	c 156,172	+ c 156,172	—	—	—	—	—
	San Paulo	153½	7.11.42	43,143	+ 9,993	—	1,620,904	1,613,860	+ 7,044	Ord. Stk.	52	24½	58	3‡
	Taltal	160	Oct., 1942	3,180	— 2,420	17	19,840	21,990	— 2,150	Ord. Sh.	1	6/-	2	Nil
	United of Havana	1,346	8.11.42	36,538	+ 18,823	19	752,194	359,691	+ 392,503	Ord. Stk.	2⅛	⅛	6½	Nil
	Uruguay Northern	73	Aug., 1942	1,072	— 262	9	2,214	2,690	— 476	—	—	—	—	—
Canada	Canadian Pacific	17,049	7.11.42	982,600	+ 50,800	44	£42,967,800	36,938,600	+ 6,029,200	Ord. Stk.	13⅞	7⅛	15	Nil
India†	Barsi Light	202	July, 1942	23,685	+ 8,903	17	63,285	67,635	— 4,350	—	—	—	—	—
	Bengal & North Western ...	2,090	July, 1942	261,600	— 5,267	18	1,080,300	1,092,128	— 11,828	Ord. Stk.	345	253	359½	5
	Bengal-Nagpur	3,267	20.6.42	284,100	+ 31,301	11	2,271,525	2,107,876	+ 163,649	,,	101	95⅛	99⅜	4‡
	Madras & Southern Mahratta	2,939	31.7.42	341,625	+ 133,549	18	2,714,939	2,473,086	+ 241,853	,,	105⅞	101¼	102	7‡
	Rohilkund & Kumaon ...	571	Sept., 1942	50,850	+ 6,416	27	352,317	367,725	— 15,408	,,	342	290	358½	4½
	South Indian	2,402	20.6.42	179,171	+ 43,616	12	1,376,295	1,113,057	+ 263,238	,,	100	87	100	4½
Various	Beira	204	Aug., 1942	82,089	—	48	825,692	—	—	—	—	—	—	—
	Egyptian Delta	607	20.9.42	10,313	+ 1,106	27	186,515	123,411	+ 63,104	Prf. Sh.	1⅛	29/-	3⅞	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	68	45	37½	9‡
	Midland of W. Australia ...	277	Sept., 1942	27,713	+ 7,393	9	84,321	58,977	+ 25,344	Inc. Deb.	90½	86½	92½	6
	Nigerian	1,900	25.7.42	70,391	+ 19,240	18	924,271	910,397	+ 13,914	—	—	—	—	—
	Rhodesia	2,442	Aug., 1942	540,350	—	48	5,371,799	—	—	—	—	—	—	—
	South Africa	13,291	26.9.42	827,897	+ 39,175	28	20,143,538	19,236,708	+ 903,830	—	—	—	—	—
	Victoria	4,774	July, 1942	1,311,554	+ 364,838	4	—	—	—	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ⅛. Argentine traffics are given in sterling calculated @ 16⅛ pesos to the £

† Receipts are calculated @ 1s. 6d. to the rupee

§ ex dividend